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A WATER USE PROJECTION MODEL FOR THE NORTH SASKATCHEWAN RIVER BASIN, ALBERTA, 1980-1985: AN INPUT-OUTPUT APPROACH

by

© SEUNG YOUNG EARMME

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

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EDMONTON, ALBERTA

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THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled A Water Use Projection Model for the North Saskatchewan River Basin, Alberta, 1980-1985: An Input-Output Approach submitted by Seung Young Earmme in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Economics.

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A WATER USE PROJECTION MODEL FOR THE NORTH SASKATCHEWAN RIVER BASIN, ALBERTA, 1980-1985: -AN INPUT-OUTPUT APPROACH-

ABSTRACT

S. YOUNG EARMME

This thesis developed a model to project future water requirements and to assess future water balance in the North Saskatchewan River Basin, Alberta. The water use projection model utilized input-output techniques. The basin input-output model was constructed with a rectangular format using the 1966 provincial input-output table and 1972 production statistics for the basin. Projected water withdrawals were then related to average streamflows to assess the possibility of water shortage.

Economic parameters of importance to water management policy, and regional economic data such as impact multipliers, production technology, regional income and expenditures, and trading patterns, were derived and analyzed. Water multipliers and a water use interaction table were also developed in order to show the interdependence of water and the regional economy, taking both direct and indirect water requirements into account. Future water requirements were forecasted, based on a set of three final

demand scenarios, and on the assumption that the technical coefficients and water coefficients would remain roughly unchanged.

Under the most probable final demand scenario, water withdrawals in the basin are predicted to reach approximately 53,000 and 64,000 million imperial gallons in 1980 and 1985 respectively, increases of 35 and 61 percent over the 1972 level. These volumes represent 272 and 327 cfs in flow terms respectively, about 34 and 40 percent of the minimum monthly streamflow available in the North Saskatchewan River (net of inter-provincial apportionment requirement).

In terms of consumptive use, the total requirement for water is projected to be 127 cfs in 1980 and 150 cfs in 1985 or some 15.7 percent and 18.5 percent, respectively, of the minimum monthly historical streamflow.

It should be borne in mind that the forecasted water requirements as presented in this study might be overestimated to the extent that demand for water will become more price-responsive in the future and to the degree that the proportion of regional supply provided by regional imports is higher for the basin than for the province.

The water resource implications that can be drawn from this study are summarized as follows.
In the short and medium run, there appears to be no danger of water shortage in the North Saskatchewan River Basin

and little likelihood that regional growth would be seriously impaired by inadequate water supplies. In the long run, however, either flow regulation or demand management may become necessary if continued growth of the basin economy is to be assured.

The crucial water management problems that will emerge in the basin in this century will be related to water quality issues rather than water quantity. In particular, water quality problems associated with thermal discharge as well as petrochemical and heavy industrial effluents will deserve more policy attention.

ACKNOWLEDGEMENTS

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CHAPTER I

INTRODUCTION

The management of water resources to meet the goals of efficiency and equity is an increasing concern to all Canadian provincial governments, including the Government of Alberta. An understanding of future water demands and water balances is a pre-requisite in the development of a long range water resource management policy.

This thesis is designed to forecast and evaluate in quantitative terms the future water balance in the North Saskatchewan River Basin, Alberta, Canada (Figure 1-1) for the period 1980-1985, and to draw implications for resource policy planning. This is done by relating anticipated future demands to average streamflows and by using an input-output water demand projection model. A basin-wide regional input-output table was constructed and a water technology matrix linking water to productivity was superimposed upon the input-output model to construct a framework with which to forecast water demands. Various policy implications were evaluated through computer simulations.

A potential water imbalance is anticipated for the basin between the year 2015 and 2035, assuming present growth trends. At that time a resource management program, possibly in the form of a flow regulation scheme or demand management, would become necessary if continued growth of the regional economy is to be assured.

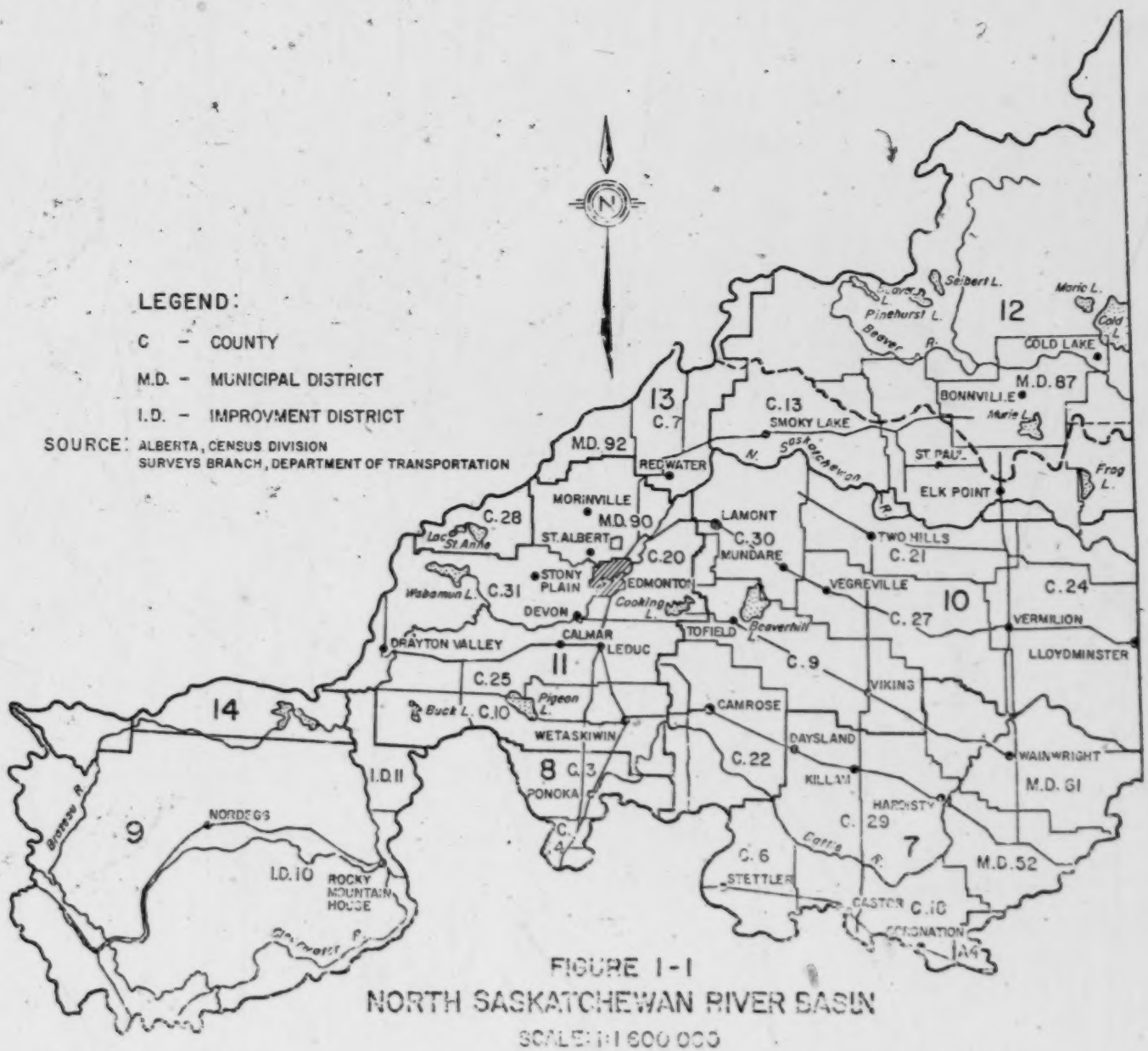

FIGURE 1-1
NORTH SASKATCHEWAN RIVER BASIN
SCALE: 1:1 600 000

Nature and Scope of the Study

From a water resource planning viewpoint, Alberta can be divided into five major river basins (Figure 1-2): (1) Peace River; (2) Athabasca River; (3) North Saskatchewan River; (4) Red Deer River; (5) South Saskatchewan River.

Alberta is considered a water-rich province, but spatial distribution of natural streamflows in relation to current and anticipated regional demand is not uniform throughout the province. Hence, water imbalances on a regional scale are possible. Most of total flow supply is concentrated in northern Alberta, whereas the bulk of demand is in the southern region. In particular, the South Saskatchewan River Basin is the dominant water using sector, due largely to irrigation agriculture, which accounts for almost 85 percent of water consumption in the basin. Moreover, increases in both population and economic growth present a challenge in resource management to meet the ever increasing need for water in the southern region.

Although the North Saskatchewan River Basin (hereafter NSRB), with which this thesis is concerned, does not have a major water user such as irrigation, extreme seasonal variation in streamflows could pose a problem in water balance within the basin if resource development, industrial growth and population increases continue into the future

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at the current pace.

The basin economy has grown rapidly both in terms of income and population since the early 1960's, and it will likely continue to grow at 3.6 percent per year[1] in real terms over the period 1980 to 1985. Concomitant with this growth will be increasing demands for water.

The purpose of this study is therefore to identify a range of water demand forecasts for the year 1980 and 1985. These demand forecasts should provide a sound basis both for decision making processes for water resource management and also the formulation of a long range water resource development plan for the basin.

Research Objectives

The general objective of the study is to provide quantitative water demand projections for the North Saskatchewan River Basin for the years 1980 and 1985, to analyze the future water balance in the basin, and to examine the policy implications for water resource management for the future.

The specific sub-objectives for research are the following:

---

[1] Based on the real GDP projections for the basin according to the Medium Scenario as derived from Table 5-6 below.

1. To review briefly the input-output (hereafter I-O) methodology, particularly that related to a rectangular format of the I-O framework, and to review major water studies in which I-O techniques were extensively used;

2. To compile a basin-wide input-output table representing 61 industries and 65 commodities in the basin for the year 1972, based on 1966 inter-provincial input-output tables for Alberta, as well as various production statistics for 1972;

3. To describe and analyze the structural characteristics of the basin economy, as evidenced in the regional input-output table, particularly focusing on areas such as the degree of industrial interdependence, trading pattern, linkage effects, and regional income and expenditure;

4. To define and analyze interactions between water and the economy by relating the factor content matrix to the inverse matrix in order to identify the sectoral water interdependence and to measure empirically the water content directly or indirectly required to produce one unit of output of a given commodity;

5. To develop three realistic economic growth scenarios, LOW, MEDIUM and HIGH, for each component of the final demand sectors, based on the analysis of past performance and future potential;

6. To make sectoral and overall economic output projections for 1980 and 1985 by computing the gross output

of each industry, as consistent with a given final demand scenario;

7. To make water demand forecasts by industry for 1980 and 1985 on the basis of a regional input-output water projection model according to the three economic scenarios postulated for the basin;

8. To investigate the future water balance for the basin in 1980 and 1985, by comparing forecasted total demands to long-term average streamflows;

9. To assess the regional water balance impacts of possible technological change or policy alternatives, through the use of policy simulation and evaluation; and

10. To draw policy implications of water resource management strategies for the basin, particularly with respect to the dates when a water imbalance may occur.

Definition of Terms

Broad terminology exists to describe the physical quantity of water used for economic activities. For example, terms such as water withdrawal, water intake, water use, water demand, and water requirement are used somewhat synonymously.

In a strict economic sense, the term "water demand" should only be used to imply a price-quantity relationship between water and its price, assuming all other parameters such as income, taste, etc., are held constant. The present study ignores aspects of price elasticities in forecasting

the quantity of water related to economic activities and rather focuses on the measurement of this relation as income or activity level varies over time. Therefore, terms such as water intake, water withdrawal or water demands[1] will be used interchangeably to indicate the physical quantity of water associated with a specific activity level or income level.

Another point to note is that "water withdrawal" for a largely non-consumptive water using sector such as thermal power generation implies a net consumptive use rather than gross use as is the case with other economic sectors. Environmental and recreational on-stream uses of water are not specifically dealt with in the present analysis because these uses are assumed to be entirely non-consumptive in nature.

---

[1]For a brief discussion of the conceptual difference between water requirement and water demand, and in particular, a discussion of supply variables, see S. V. Ciriacy-Wantrup, "Projections of Water Requirements in the Economics of Water Policy," Journal of Farm Economics, 43 (May : 1961), pp. 197-214.

CHAPTER II

A SURVEY OF INPUT-OUTPUT METHODOLOGY, AND ITS APPLICATION TO WATER RELATED PROBLEMS

General

Input-Output analysis is one of the most simplified quantitative descriptions of part of a Walrasian general equilibrium model[1] of an economy. It could also be viewed as a gross transaction table for an economy, displaying in matrix form all the inter-sectoral product flows between and among all industries, including primary factors, thereby providing an understanding of the structure of the economy in great detail. It is much more comprehensive in detail than are the GNP national accounts,[2] because the latter deals only with the value added concept, ignoring transactions

---

[1]Robert Dorfman, Paul A. Samuelson and Robert M. Solow, Linear Programming and Economic Analysis, (New York: McGraw-Hill Book Co., 1958), p. 204. Also for an interesting line of thought by Klein advocating a fully integrated feedback system combining both Keynesian Aggregate Demand Model and Leontief type Supply Model, see Lawrence R. Klein, "The Supply Side," American Economic Review, 68 (March, 1978),pp. 1-7.

[2]For a brief overview of the relationship between GNP accounts and input-output table, see H. I. Liebling, "Interindustry Economics and National Income Theory," Input-Output Analysis: An Appraisal, (Princeton : Princeton University Press for the National Bureau of Economic Research, 1955), pp. 291-320.

respecting intermediate inputs. The focus of I-O analysis is on input structure, that is, both intermediate and primary inputs required for production of each industry as well as the allocation pattern of a product either as an intermediate good or a final demand component.

The origin of this idea may be traced back as early as the eighteenth century when, with a so-called Tableau Economique, the French economist Francois Quesnay envisioned the functioning of an economy as one of circular flows of wealth among major economic classes. However, it was not until the 1930's when Leontief, applying linear production technology to a Walrasian mathematical system, first succeeded in developing an input-output table for the American economy.[1] His studies highlighted sectoral interdependence among industries based on empirical data and forecast output requirements by industry as consistent with a specified bill of final consumption. Following this pioneering research, the usefulness of the analysis with regard to both structural analysis and forecasting became widely accepted around the world, resulting in compilation of national input-output tables in over fifty countries.

---

[1]Wassily Leontief, "Quantitative Input-Output Relations in the Economic Systems of the United States," Review of Economics and Statistics, (August:1936), pp.105-125. For standard text books dealing with input-output economics, see: (1) H. Chenery and P. Clark, Interindustry Economics, (New York : John Wiley & Sons, 1959); (2) W. Miernyk, The Elements of Input-Output Analysis, (New York : Random House, 1965); (3) C. Yan, Introduction to Input-Output Economics, (New York : Holt Rinehart & Winston, 1969); and (4) R. Dorfman, P. A. Samuelson and R. Solow, Linear Programming and Economic Analysis.

As noted, an input-output table is an array of technical production functions for all industries, augmented by an exogenous sector of final demand expenditure. The major assumptions on which input-output analysis is based are:

1. Fixed technical coefficients--each input required for production is directly proportional to the level of output only. Furthermore, the technical input coefficients thus derived are assumed to be constant over time.[1]
2. No joint production--each production process is associated with only one output (note, however, that this assumption is not needed for the rectangular format wherein joint production can be accomodated in a more essential way).
3. No externalities.
4. Only current flows of inputs are considered--capacity and capital requirements are ignored.

Detailed discussion of various assumptions related to the Leontief input-output model are available in text

---

[1] R. Dorfman, P. A. Samuelson and R. Solow, Linear Programming and Economic Analysis, p. 224 and p.249. The assumption of fixed technical coefficients is taken to mean no substitution between factor inputs; however, as shown by Dorfman et al. under the so-called "Substitution Theorem", this assumption is compatible with substitution among inputs if there is only one scarce factor in the economy, i.e. labour, and constant returns to scale prevails. Under these circumstances, relative factor prices cannot change; hence, one physical input-output ratio will continue to be observed.

such as "Interindustry Economics" by Chenery and Clark[1] and are not repeated here.

Most of the input-output tables that were published since the American table by Leontief have been formulated in a so-called "square format". Implicit in this form is the assumption that the structure of an economy can be broken down into as many industries as there are products, and each industry is more or less characterized by its distinct product. However, with increasing complexity and diversification in the economic structure, the problem of how to treat secondary products in constructing a square table necessarily involved fictitious intersectoral transfers because the inputs considered to be associated with production of a secondary product have to be imputed to the sector of which it is a primary producer.

In order to solve the conflicts concerning industry vs. product classifications as related to the tabulation of a table, a new accounting device called the "rectangular format"[2] was introduced in the United Nations System of National Accounts (SNA).

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[1] In addition to this, the above cited standard references on input-output economics provide treatment of crucial assumptions related to input-output analysis. For an excellent review of I-O assumptions, see Carl Christ, "A Review of Input-Output Analysis," Input-Output Analysis: An Appraisal, pp. 137-69.

[2] A first systematic discussion regarding the rectanular format is given by Abraham Aidenoff, "Input-Output Data in the United Nations System of National Accounts," Applications of Input-Output Analysis, eds., A. P. Carter and A. Brody, (Amsterdam : North-Holland Co., 1970), pp. 349-68.

This new format involves one rectanular table called the "domestic market share matrix" which shows the industry supply share of each commodity output, while another matrix called the "industry technology matrix" is used to describe commodity composition of input purchases by each industry.

The distinct advantages of a rectangular format as compared to a standard square format in the input-output analysis were summarized by A. Carter and W. Leontief as follows:

> The format suggested by SNA has two very important advantages: (]) it admits as much detail as is available in the basic census sources; and (2) the meaning of each entry is straightforward because observed transactions are not combined with fictitious transfers.[1]

There are no major disadvantages to this rectangular format except that the compilation of the tables become more involved in terms of data delineation. In addition to the advantages stated above, the meaning of the impact multiplier table becomes clearer in the rectangular form because final consumption is measured in terms of a commodity basis rather than an industry output basis; thus, commodity-to-industry impact measurement provides a

---

[1] A. Carter and W. Leontief, "Goals for the Input-Output Data System in the Seventies," Survey of Current Business, Office of Business Economics, U. S. Department of Commerce, (Washington D. C. : July 1971), p. 31.

a more accurate account of impact multiplier effects. In view of the fact that the rectangular format to be used for the present analysis is fairly new (although the basic principles remain the same) and that the traditional square format has been described extensively in the literature, the broad outline of this new format and its features will be presented in the following section.

Basic Input-Output System in Canada

In Canada, the official organization in charge of compiling national input-output tables is Statistics Canada. Since its first project "The Interindustry Flow of Goods and Services, Canada, 1949" was published in 1959, Statistics Canada has continuously improved the quality of national tables by developing and utilizing new methodology as well as refinements in sectoral classifications. Recently, in a report entitled "The Input-Output Structure of the Canadian Economy, 1961 - 1971",[1] Statistics Canada published a series of national tables based on a rectanular format. These tables included both a domestic market share and an industry technology matrix, each tabulated with two aggregation levels, medium(M) and small(S). As noted previously,

---

[1]Statistics Canada, The Input-Output Structure of the Canadian Economy, 1961-1971, (Ottawa : 1977). This section draws, in large part, upon this material as well as A. Aidenoff, "Input-Output Data in the United Nations System of National Accounts," particularly the Mathematical Appendix.

the major improvement of the rectangular format stems from the fact that it attempts to distinguish commodity classifications on the one hand from industrial classifications on the other to allow flexibility in analysis and to reduce possible error arising from fictitious transfers inherent in the traditional square format.

The Canadian national tables have been compiled in three levels of aggregation of commodities and industries, of which only small (S) and medium (M) levels have been published due to the confidential nature of the large (L) aggregation table (Table 2-1).

TABLE 2-1

STATISTICS CANADA LEVEL OF AGGREGATION
OF COMMODITIES AND INDUSTRIES

Designation of Aggregation	Number of Industries	Number of Final Demand Categories	Number of Commodities & Primary Inputs
Small (S)	16	14	49
Medium(M)	43	14	100
Large (L)	191	136	602

Source: Statistics Canada, The Input-Output Structure of the Canadian Economy, 1961 - 1971 (Ottawa : 1977), pp. 7-11.

Table 2-2 provides a systematic presentation of the flow of either commodity outputs or industry outputs among one another, including primary factors as well as transactions between producing sectors and final demand sectors. The two cornerstones of this scheme that play a major role in the later analysis are the [V] and [U] matrices.

Suppose the case of an economy with n commodities and m industries. The matrix [D] called the "domestic market share matrix" is a representation indicating the share of each industry as a producer of each commodity relative to the total output of that commodity. Matrix [D] is obtained by dividing each element in the column of [V] by its total commodity output, the dimension being (mxn). The result shows the supply source allocation by industry of each commodity produced. The [D] matrix is, of course, based upon the simple assumption that each industry will maintain its constant share in the supply of a particular commodity as observed in the base year. From an operational point of view, the [D] matrix could also be regarded as a transformation parameter whereby a commodity output vector can be transformed into an industry output vector, or vice versa. In other words, it indicates what the output level of each industry will be, given a specified level of each commodity output, if each industry is called upon to contribute a fixed share to producing this level of output, as observed in the base

TABLE 2-2

THE ACCOUNTING FRAMEWORK OF CANADIAN I-O TABLES

	Commodities	Industries	Final Demand	Total
Commodities		U	F	q
Industries	V			g
Value Added e.g. Wage Profit Taxes (-) Subsidies Others		YI	YF	n
Total	q'	g'	e'	

Notations :
V : Matrix of the values of commodity outputs
U : Matrix of the values of intermediate commodity inputs
F : Matrix of the values of commodity inputs of final demand
YI: Matrix of the values of primary inputs of industries
YF: Matrix of the values of primary inputs of final demand
q : Vector of the values of total commodity outputs
g : Vector of the values of total industry outputs
e : Vector of the values of total inputs of final demand
n : Vector of the values of total primary inputs

Source : Statistics Canada, The Input-Output Structure of the Canadian Economy,1961-71, (Ottawa : Queen's Printer, 1977), p.13.

year.

The [B] matrix, or industry technology matrix, is analogous to the matrix of technical coefficients [A] in the conventional square format. The [B] matrix is obtained by dividing the elements in each column of the matrix [U] by the corresponding total industry output. The result shows a flow of intermediate input requirements, by commodity (rather than industry), for each industry's unit operation. The assumption regarding this production function is that the values of commodity inputs are fixed proportions of the level of industry output regardless of its output composition. The operational significance of the [B] matrix is that it enables us to transform a given industry output vector into a commodity vector showing total input requirements by all industries for their intermediate uses, as classified by each commodity.

Armed with the [D] and [B] matrices, it is a simple matter to derive an inverse matrix or "impact table" that will constitute a powerful analytic tool with which to investigate the sectoral impacts as well as to analyze water interdependencies of a regional economy.

The basic commodity accounting balances in the rectangular format can be stated as;

$$\begin{bmatrix} q_1 \\ q_2 \\ . \\ . \\ q_n \end{bmatrix} = \begin{bmatrix} b_{11} & b_{12} & \cdots & b_{1m} \\ b_{21} & b_{22} & \cdots & b_{2m} \\ . \ . \ . & & \cdots & . \\ . \ . \ . & & \cdots & . \\ b_{n1} & b_{n2} & \cdots & b_{nm} \end{bmatrix} \begin{bmatrix} g_1 \\ g_2 \\ . \\ . \\ g_m \end{bmatrix} + \begin{bmatrix} f_1 \\ f_2 \\ . \\ . \\ f_n \end{bmatrix}$$

In matrix form, the above system of equations can be rewritten as :

$$q = Bg + f \qquad (2\text{-}1)$$

The above equation system states that for each commodity, the total intermediate demand (Bg) plus final demand (f) must balance with total commodity output (q). Transforming this system of equation on a commodity basis into the corresponding system on an industry basis by premultiplying by the domestic market share matrix (D), the following equation system is generated:

$$Dq = DBg + Df \qquad (2\text{-}2)$$

Equation system (2-2) states that, in terms of an industry output basis, total output (Dq) must balance intermediate use (DBg) plus final demand use (Df). Since Dq is the total industry output vector g, this can be rewritten as :

$$g = DBg + Df \qquad (2\text{-}3)$$

or

$$[\ I - DB\ ]\ g = Df \qquad (2\text{-}4)$$

where I is an identity matrix.

Equation system (2-4) can be solved for industry output g by premultiplying the inverse $[\ I - DB\ ]^{-1}$ on both sides, yielding:

$$g = [\ I - DB\ ]^{-1}Df \qquad (2\text{-}5)$$

The matrix $[\ I - DB\ ]^{-1}D$ is called an "impact table" that, in principle, is analogous to a standard Leontief inverse matrix $[\ I - A\ ]^{-1}$ for a square format. It shows the direct and indirect impacts on the <u>industry output vector</u> of a change in final demand where final demand is in terms of a <u>commodity vector</u>. If we represent this inverse $[\ I - DB\ ]^{-1}D$ simply by R, the dimensions of this R matrix will be m x n, i.e., (industry by commodity) and therefore the impact table is read as follows:

the element r_{ij} shows the total impact on the ith industry's output of a unit change in final demand for the jth commodity.

Input-Output Analysis and Water Studies

Traditionally, water use projections have seldom gone beyond applying a single sectoral approach correlating per-capita or per-employee (e.g. gallon/employee) water consumption to the projected population or projected level of output.[1] The empirical application of input-output or linear programming approaches to resource requirement projections or allocation problems has not been widely used, especially in Canada. This is partly because: (1) a substantial (sometimes prohibitive) amount of data is needed to construct a regional input-output table of reasonable size, (2) much computer time and software programming is required to perform the necessary calculations, (3) the availability of regional data is usually limited compared to the national data base.

Since the early 1960's, however, considerable interest has been expressed in applying I-O or linear programming techniques to long range water resource management problems, particularly in California and Arizona, where

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[1]The current practice in Canada of estimating water demand projections based mainly on elementary methods and the desirability of applying a systems approach to water forecasting are stressed in Donald Tate, Water Use and Demand Forecasting : A Review, p. i. Environment Canada, prepared for International Institute for Applied Systems Analysis, (Ottawa:1977).

water balance problems are common. Three representative studies in which input-output or linear programming techniques were used in resource projections and optimum allocations are: (]) Lofting and McGauhey's California water studies;[1] (2) Kelso, Martin and Mack's study on Arizona water scarcities;[2] and MacMillan et al.'s study of the Manitoba Interlake area.[3] These are discussed in the following sections.

The California Study

The water research works initiated by Lofting and McGauhey at the University of California, Berkeley, and published in a series entitled "Economic Evaluation of Water" were the first empirical attempts to integrate the economic role of water resources into a general equilibrium framework representing a regional economy through an input-output

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[1] E. M. Lofting and P. H. McGauhey, Economic Evaluation of Water, Part III; An Interindustry Analysis of the California Water Economy, (Berkeley: Contribution No. 67, Water Resources Center, University of California, 1963) and E. M. Lofting and P. H. McGauhey, Economic Evaluation of Water, Part IV: An Input-Output and Linear Programming Analysis of California Water Requirements, (Berkeley : Contribution No. 116, Water Resources Center, University of California, 1968).

[2] M. Kelso, W. Martin and L. Mack, Water Supplies and Economic Growth in an Arid Environment: An Arizona Case Study, (Tucson: University of Arizona Press, 1972).

[3] J. MacMillan, C. Lu and C. Framingham, Manitoba Interlake Area: A Regional Development Evaluation, (Ames, Iowa: Iowa State University Press, 1975).

system interacting with a regional water use pattern. The purpose of the research was to: (1) provide an insight into the structure of the water economy of California, i.e., sectoral water interdependencies of the economy by estimation and analysis of the state water interaction table; (2) to forecast the magnitude of total future water requirements necessary to sustain an anticipated consumption pattern in the future; (3) to provide a basis for formulating possible water development projects to meet the anticipated water demand; (4) to provide economic parameters essential to project evaluation, such as the shadow price of water, water use multipliers, income multipliers, etc. This research would aid decision makers in identifying resource projects that would maximize benefits in relation to Gross Regional Income. The major analytic tools employed were the 1947 and 1958 California input-output tables, compressed into 31 and 24 sectors respectively, and a linear programming formulation based on these I-O tables, with available resources as a constraint.

The study employed the following logic: the economic equilibrium that has to be maintained between producing sectors and final consuming sectors can be represented by a Leontief Inverse Matrix $[I - A]^{-1}$. This matrix indicated the output requirements, both direct and indirect, that are necessary to sustain a unit increase in final consumption. A water use matrix, when superimposed on this inverse matrix, established a linkage between resource requirements and final

consumption. Thus, water use requirements were projected as follows, given a specified final demand vector:

$$(\text{Water Resource})_t = W [I - A]^{-1} Y_t \quad (2\text{-}6)$$

Where

A : Technical input coefficient matrix
I : Identity matrix
W : Water matrix, a diagonal matrix with diagonal elements being respective water coefficients and all the off-diagonal elements being zeros
Y : Final demand vector
t : Time variable

Equation system 2-6 forecasts the sectoral water use requirements as well as total water use requirements when the final demand scenario is specified. The matrix $W [I - A]^{-1}$, termed the water interaction table, shows the structure of the water economy in terms of inter-sectoral water use relationship: in other words, it indicates how much impact water use by one industry will have upon another industry.

The value of this research appears to be that it stressed the advantage of a general equilibrium approach to water resource problems and that it demonstrated how the I-O or LP technique can be effectively applied to an overall resource planning process.

The weakness in the analysis may lie less in the

methodology than in the lack of reliable data, especially on a regional level. Adequate data are essential to develop either the input-output table or the water use matrix. In particular, the lack of primary data on the regional input structure of the California economy resulted in the use of the national coefficient table to approximate the inter-industry matrix. The input structure of the state economy may deviate from that of the national economy, and furthermore, by the nature of interdependence of the economic structure, a small error in one industry can be transmitted to another sector via matrix inversion, and this would reduce the validity of the results. The same holds true for estimates of water use coefficients for which sufficient regional water use surveys are lacking. This is why a compilation of a regional input-output table is crucial to this approach to water resource planning. Also, since water resources are regional in supply and demand, and normally within the boundary of a river basin, the importance of constructing a regional I-O table as opposed to a national table cannot be overemphasized.

The Arizona Study

In evaluating the consequences of a declining ground water table in the arid state of Arizona, Kelso et al., used both linear programming and input-output models to establish empirically if a scarcity of water would affect the growth potential of the state economy. Specifically,

they postulated a linear programming model that, under a profit maximizing objective, would simulate the economic behaviour of the sector most sensitive to cost of water, i.e., agriculture, in order to forecast the optimal cropping pattern and subsequent water use requirements for the projection period, 1966-2015. Assumptions were that a representative farmer would maximize his returns, given alternative cropping patterns, expected unit revenues, farming technology and, in particular, gradually increasing pumping costs due to the declining groundwater table.

The use of linear programming in this study was limited to determining the optimal economic behaviour of one particular sector that was expected to experience increasing costs. The input-output table comprising 27 sectors of the Arizona economy compiled by Tijoriwala, et al.,[1] was only utilized to evaluate the secondary effects of an initial change in agricultural production brought about by increasing water costs. Even in this limited application, the technique proved instrumental in tracing through backward and forward linkages in order to determine the indirect impacts of changes in agricultural production.

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[1] A. G. Tijoriwala, W. E. Martin and L. Bower, The Structure of Arizona Economy: Output Interrelationships and their effects on Water and Labour Requirements, Part I: The Input-Output Model and its Interpretations, and Part II: Statistical Supplement, (Tucson: Agricultural Experiment Station, University of Arizona, 1968).

The study highlighted the potential economic gains that might accrue from structural changes in the economy, (e.g. demand shifting policy toward less water-intensive sectors) as well as quantification by commodity of water content embodied in traded commodities, analogous in approach to the factor endowment theory in international economics. The study also concluded that a higher growth pattern than originally postulated could be attained with minimum development of water supply if a shift in economic structure towards production of goods with a high value per unit of water input could be achieved, either through free market forces or through conscious economic and trade policies.

The Manitoba Study

Although this study was not directly related to investigations of water problems, the methodology utilized in the report "Manitoba Interlake Area: A Regional Development Evaluation" for assessing the regional impacts of changes in governmental programs and expenditures demonstrated how important and strategic a regional I-O technique could be in tracing out and highlighting the intersectoral and total impact of changes in public expenditures. The number of sectoral classifications was few (only 17 sectors), and the format used was based on a square rahter than a rectangular one. Even in this limited application, however, the study was able to provide a means of evaluating the effectiveness of various

expenditure programs for regional development, and to furnish both an integrated view of the area economy in terms of its economic viability, and a conceptual framework for quantitative evaluation of impacts on the area economy of changes in government spending.

CHAPTER III

STRUCTURE OF THE BASIN ECONOMY

Background

The North Saskatchewan River Basin in Alberta drains an area of roughly 38,000 square miles, about 15 percent of the province. The river arises in the foothills of the Rocky mountains, flows eastward across the interior plains into Saskatchewan, and ultimately finds its way to Hudson Bay.

The basin encompasses Census Divisions #7, 8 (part), 9, 10, 11 (part) and 12, including five cities, seventeen counties, three improvement districts and four municipal districts (see Appendix A). The population of the basin as of mid-1972 was estimated to be 733,434 or 44.0 percent of the total population of the province. Almost 70 percent of the population of the basin is centred in the Edmonton metro urban area.

The importance of the basin economy is best illustrated by the fact that, with 15 percent of the province's area and 44 percent of the population, the NSRB region in 1972 contributed $3,777 million, or approximately 44.6 percent of the provincial Gross Domestic Product (GDP). The regional Gross Domestic Product per capita of the basin thus showed a value of $5,151 as

compared to the provincial average of $5,121 and was about 7.3 percent above the Canadian average of $4,836.

The structure of the basin economy, as shown by industry origin, indicates no marked difference between the basin and provincial economies. Its structural features bear out the fact that the service industry occupies the largest share of Gross Domestic Product (22.5 percent), followed by mining (14.0 percent), construction (9.7 percent), manufacturing (9.4 percent) and trade service (9.3 percent). When compared to the provincial economy, the region appears to have a slightly higher percentage in mining, service, construction, and public administration (Table 3-1).

For the past 15 years, the economy of the province has outperformed that of the Canadian economy in terms of rate of real growth. During the period of 1961-1976, it recorded an average compound rate of real growth of 6.5 percent,[1] resulting in an almost three-fold increase in goods and services produced, whereas the Canadian economy during the same period has grown at a rate of 5 percent per year,[2] a two-fold increase

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[1]Since there are no official estimates available of Alberta GDP in constant dollars, these series were estimated by deflating the current GDP as given in Economic Accounts, Alberta with Canadian GNP deflators for non-mining sectors; for the Alberta mining sector (predominantly oil and gas), real mining GDP was estimated by deflating current mining GDP figures by the index of oil and gas prices.

[2]Canadian GDP deflated to 1971 constant dollars by applying Canadian GNP deflators.

TABLE 3-1

GROSS DOMESTIC PRODUCT BY INDUSTRY, 1972, NSRB AND ALBERTA

(millions of dollars)

	NSRB		Alberta	
	Value	%	Value	%
Agriculture[1]	218	5.8	683	8.1
Mining[2]	529	14.0	1,148	13.6
Manufacturing	354	9.4	826	9.8
Construction	368	9.7	756	8.9
Transportation[3]	277	7.3	774	9.1
Utilities	125	3.3	201	2.4
Trade[4]	352	9.3	1,002	11.8
Finance[5]	343	9.1	835	9.9
Services	851	22.5	1,650	19.5
Public Administ	360	9.6	595	7.0
GDP at market prices[6]	3,777	100.0	8,470	100.0

Notes: (1) includes forestry, fishing, hunting and trapping.
(2) includes oil and gas extraction activites.
(3) includes storage and communication.
(4) includes retail and wholesale services.
(5) includes insurance and real estate.
(6) Since only the GDP at factor cost by indsutry is available for Alberta, the GDP at market prices concept is estimated by applying the overall ratio of indirect tax less subsidy to each industry's GDP at factor cost.

Sources: Alberta Bureau of Statistics, Economic Accounts, 1975, (Edmonton : 1976), and NSRB I-O tables, particularly Table C-4 in Appendix C.

over the 1961 GDP. During the period 1970-1975, the difference in real growth rates between the province and Canada was even greater. During this period, the Alberta economy has been growing at an average annual rate of 7.3 percent compared to 4.6 percent for the Canadian economy. The reason for this remarkable growth differential has been the development of energy resources and its spillover effects on the rest of the provincial economy.

During the period 1961-1975, the financial sector of the Alberta economy contributed 19.6 percent to overall growth, followed by mining (17.5 percent), services (15.3 percent), trade (9.6 percent), construction (8.3 percent), manufacturing (8.1 percent), agriculture (6.4 percent), public administration (6.0 percent), utilities (1.8 percent) and forestry (0.1 percent). This breakdown, as well as the total values for GDP are indicated in Table 3-2. It is probable that the economy of the North Saskatchewan River Basin exhibited a similar growth pattern.

The total volume of water required to generate the GDP in the NSRB, as well as to sustain final consumption, in 1972, was estimated to be 323,047 million imperial gallons. A sectoral breakdown of this water intake is shown in Table 3-3. The predominant use of water in the basin was electric power generation, drawing more than 87 percent of the total intake. Since almost

TABLE 3-2

GROWTH PATTERN AND ITS ORIGIN IN THE ALBERTA ECONOMY, 1961-1975

(millions of current dollars)

	1961 GDP	1975 GDP	Percentage Share of GDP Growth
Agriculture	312	1,102	6.4
Forestry	10	22	0.1
Mining	334	2,494	17.5
Manufacturing	294	1,296	8.1
Construction	228	1,256	8.3
Transportation	289	1,188	7.3
Utilities	89	310	1.8
Trade	371	1,584	9.6
Finance	387	2,812	19.6
Services	422	2,316	15.3
Public Admin.	198	944	6.0
GDP at factor cost	2,934	15,304	100.0

Note: Percentage share of GDP growth for each sector is defined as sectoral share of overall GDP growth as measured in terms of percentages.

Source: Alberta Bureau of Statistics, Alberta Economic Accounts, 1976 (Edmonton : 1977).

99.9 percent of the water withdrawn by this sector was discharged back into the system, very little was actually consumed. Hence, in this analysis, power generation usage has been excluded. Thus, ignoring power generation, the total water intake in NSRB amounted to roughly 39,779 million imperial gallons in 1972, or approximately 9.0 percent of the provincial total water intake.

TABLE 3-3
WATER INTAKE BY MAJOR SECTOR, NSRB, 1972
(million imperial gallons)

Sector	Intake	Percentage
Agriculture[1]	3,275	1.0
Mining	11,572	3.6
Manufacturing	10,111	3.1
Other industries	1,252	0.4
Power generation	283,268	87.7
Domestic	13,569	4.2
Total	323,047	100.0

Note : (1) Agricultural use is entirely for livestock watering due to the absence of irrigation.

Source : Alberta Department of Environment, Industrial Water Use Survey, 1972 and author's estimates for agricultural and domestic uses.

It is apparent that the NSRB is not an intensive user of water since it required only 9.0 percent of the provincial water intake to produce 44.5 percent of the provincial GDP. This aspect, however, is largely the result of the fact that the major consumptive use of water in the province is in the agricultural sector, overwhelmingly in irrigated agriculture in the South Saskatchewan River Basin.

Choice of A Model and Underlying Considerations

The choice of an input-output methodology to analyze the regional economy and its water characteristics was based on the following considerations: (1) it provides a simplified general equilibrium framework of the basin economy, thus furnishing an integrated view of the regional economy; (2) both trend extrapolation and single sectoral approaches were considered inadequate in dealing with the economic system of the region, particularly in relation to structural interdependence and consequently total water demands for the region; (3) it is the only methodology available that can empirically establish the linkage between final demand and water requirements; (4) the 1966 Alberta provincial input-output table was available for estimating the NSRB regional input coefficients; and (5) the 1972 Industrial Water Use Survey, comprising as many sectors as is consistent with the regional I-O classification, was available for the province as well as for the

major river basins.

The size of an input-output table (number of sectors) to use in a study depends on three considerations; (1) the nature of the study, (2) data availability, and (3) time and budget constraints. In the present case, the study is to analyze water resource problems, hence emphasis is on the water-using industries, such as oil and gas, petrochemical, and meat processing. The Canadian input-output tables, 1961-1971, as compiled annually by Statistics Canada, used three levels of aggregation for commodity and industry classifications: Large (L), Medium (M), and Small (S). The dimensions of the table in the present study should at least approximate that of the M aggregation; the L aggregation appears prohibitive in terms of data and time requirements, and the S level appears too aggregated to be useful.

The sectors chosen for analysis are presented in Appendix B, along with the counterparts to SIC and Statistics Canada L aggregation levels. Initially, 79 commodities and 65 industries, including three dummy industries and three dummy commodities were considered. This is similar to Statistics Canada's Medium (M) aggregation level with 43 industries and 92 commodities. The present commodity classification is less detailed than the M aggregation, probably because of the absence of regional production of some manufactured goods, whereas industry classifications are more detailed than the M

aggregation. Following a crosscheck with data availability and analytic requirements, the classification was adjusted downward to 65 commodities and 61 industries. On the commodity side (1) cattle & calves, hogs, sheep and lambs were consolidated into one livestock sector; (2) beef, veal, pork and other meats were consolidated; (3) flour, cereal and bakery products were combined into one commodity; (4) yarn, fibre, fabrics and textiles were also consolidated into one commodity; (5) numerous service categories were consolidated into two major sectors, personal and business service; and (6) three dummy industries and commodities were dispensed with and their flows allocated to appropriate sectors through an imputation method called a supply recipes device.[1]

When compared with other input-output studies in Alberta, this level of classification is more disaggregated, particularly in non-agricultural sectors. The first Alberta input-output table[2] used only 31 industrial sectors, and

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[1]This involves a procedure of imputing the unidentifiable inputs required by each industry subsumed under the catch-all expense item "dummy industry" to the appropriate sectors from which inputs are assumed to be purchased. For example, the total input requirements by each industry under a dummy input item called "operating, office, laboratory and food" were broken down into the furniture, paper and allied, miscellaneous manufacturing and restaurant services to each of which it is imputed accordingly. This method was suggested by Professor A. W. Anderson, Department of Rural Economy, University of Alberta, to whom I am grateful.

[2]R. W. Wright, The Alberta Economy: An Input-Output Analysis, 1962 (Department of Economics, University of Calgary, 1963).

a preliminary input-output table for the South Saskatchewan River Basin,[1] had 35 sectors, 15 in agricultural production due to the emphasis placed on irrigation farming in southern Alberta.

There are two basic approaches to the construction of a regional transaction or flow table in input-output analysis: the direct method and indirect method. The direct method of constructing a transaction table involves the following steps: (1) determining the gross output totals for each industry by using census or other published statistics, (2) determining the input purchases and product sales for each industry either from published data or questionnaires, and (3) crosschecking the flows of each product for consistency in supply and disposition, and fixing each cell of the table as compatible with the system.

There are several problems with the direct approach which precluded its use in this study. The data requirements of a table are generally large, particularly in regional studies. Also a regional breakdown of national data by type of information and desired geographic boundary is usually unavailable. A particular problem for the present study was that information regarding input purchases by commodity for each industrial activity was unavailable at a sufficiently detailed level for a 65x61 table.

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[1] Roger Long, "An Economic Input-Output Study of the South Saskatchewan River Basin of Alberta in 1969," (unpublished manuscript, University of Alberta, 1972).

Consequently, an indirect method of generating a transaction table for the NSRB regional economy was adopted by utilizing the inter-provincial input-output table for Alberta as compiled by Statistics Canada. The indirect generation of a regional basin transaction table from a provincial, rather than a national, input-output table has two main advantages. The provincial table provides information on production technology at the NSRB level more accurately than would a national table, thus minimizing the error involved in estimating regional technical coefficients. Furthermore, the product mix for the provincial economy is expected to resemble the basin economy more closely than would the product mix for the Canadian economy.

Since the provincial table was the prime source of information in constructing the regional table for the NSRB, the usual estimating procedure is reversed. Rather than first estimating the transaction table and then generating the matrix of technical coefficients (as in the direct approach), the coefficient matrices comprising both the domestic market share matrix (D) and the industry technology matrix (B) were first obtained for the basin by taking corresponding matrices for the provincial economy and then used to calculate the associated basin flow tables in dollars, (V) and (U). In this procedure, (D) was multiplied by the vector of commodity outputs for the basin while (B) was multiplied by the vector of industry outputs for the basin.

The Regional Tables of the Basin Economy

The transactions that took place in 1972 among various sectors of the NSRB economy were systematically recorded in a set of regional input-output accounts, which were composed of (1) a domestic market share table, (2) an industry technology table, and (3) final demand and value added sectors.

This set of regional tables constitutes the basic framework of the I-O system. It will provide insight into the following economic questions. How much gross value of goods and services was produced within the basin? What portion of the total supply is reliant on external sources of supply? How much of the total production was consumed as intermediate demands within the basin as opposed to final disposition? How much of the total production is devoted to exports outside the basin? What is the degree of industrial linkage as shown by the proportion of internal processing to the total production? How much income or value added, such as wages , salaries, interest, taxes, etc., has been generated within the basin? What are the major expenditure patterns of final demands? These economic aspects with regard to the basin economy will be examined in the following sections.

Domestic Market Share Matrix

The domestic market share matrix indicates both the industry share of each commodity's total output and the commodity share of each industry's total output. The domestic market share matrix, V, for the basin in terms of 1972 dollars as shown in Table C-2, Appendix C was generated by multiplying the domestic share coefficients matrix, D, shown in Table C-1, Appendix C by the vector of commodity outputs as estimated for the basin by disaggregating provincial production statistics to the basin level. The market structure of the basin economy, as shown by Table C-2, indicates that the agricultural sectors possess a fair degree of joint product nature in the sense that a commodity is produced not only by its primary producers but also by other agricultural sectors as well. For example, of the total value of production in hay and forage, amounting to $48,721,000, about $452,000 was supplied by wheat producers, $439,000 by barley producers, and $581,000 by other grain producers. Primary forage producers generated the remaining $47,250,000. Similarly, cement and concrete products and other industries tend to show a joint product nature. Most industries, however, are identified as the sole producer of a distinct product.

Industry Technology and Flow Matrices

The industry technology coefficient table represents the production process of each industry. The

table corresponds conceptually to the matrix of technical coefficients commonly known as (A) in a conventional Leontief square format. The matrix indicates the degree of industrial interdependence within the processing sector, and this interdependence is reflected in the determination of multiplier effects arising from any initial increase in production.

The industry technology flow matrix U, which is measured in terms of 1972 dollars for the basin and which is the derived industry flow table, is shown in Table C-4, Appendix C. It was obtained by post-multiplying the industry technology matrix, B (in coefficient form as given in Table C-3, Appendix C), by the vector of industry outputs which was estimated for the basin by disaggregating provincial production statistics to the basin level. Summing across each row of the industry flow matrix in dollar terms shown in Table C-4, it can be seen that, of the gross value of $5,999 million in total outputs by all industries in the NSRB, intermediate transactions through input purchases by all industries totalled $2,581 million, or about 43.1 percent of the gross output. The total value added was $3,418 million. In other words, for every dollar of output produced within the region, almost 43 cents was spent on intermediate purchases for further processing, while the rest, 57 cents, accrued in the form of value added, such as wages, salaries, profits, unincorporated income, taxes and depreciation.

The following table shows the percentages of intermediate input purchases to the total gross value of production by major industry group (Table 3-4).

TABLE 3-4

RATIO OF INTERMEDIATE INPUTS AND VALUE ADDED BY MAJOR INDUSTRY, NSRB, 1972

(millions of dollars)

Sector	Intermediate Inputs		Value Added		Total Output	
	Value	%	Value	%	Value	%
Agriculture	275	56	218	44	493	100
Mining	276	34	529	66	805	100
Manufacturing	811	70	354	30	1,165	100
Construction	510	58	368	42	878	100
Transportation	75	21	277	79	352	100
Utilities	44	26	125	74	169	100
Trade	176	33	352	67	528	100
Finance	84	20	343	80	426	100
Services	331	28	851	72	1,182	100
Total	2,581	43	3,418	57	5,999	100

Note: covers only the sectors included in the processing sector, hence public administration is not included.

Source: As calculated from the 1972 Input-Output Table, NSRB.

When one compares input structures of industries in terms of intermediate purchases and factor income shares, it appears that tertiary industries are generally associated with a relatively high ratio of value added, ranging from 67 percent to as high as 80 percent. This indicates factor income proportions are high relative to value of production. On the other hand, primary and secondary industries have comparatively low ratios of value added. Secondary manufacturing usually has the lowest value. For example, while finance, services, transportation, utilities and trade industries had gross values of production of $426 million, $1,182 million, $352 million, $169 million and $528 million respectively, the values added in the form of factor income accrued were as high as $343 million, $851 million, $277 million, $125 million and $352 million respectively, representing income ratios of 80 percent, 72 percent, 79 percent, 74 percent and 67 percent for respective industries, and these were paid as wages, salaries, profits, rents and taxes to factor owners. These ratios are considerably above the regional industrial average of 56.9 percent. On the other hand, agriculture, manufacturing, construction and mining industries, with their respective gross values of production of $493 million, $1,165 million, $878 million and $805 million, generated factor incomes in the order of $218 million, $354 million, $368 million and $529 million, representing income ratios of only 44 percent, 30 percent, 42 percent, and 66 percent

respectively. On an individual industry basis, wheat producers, for example, produced a total value of $66.3 millions in 1972. In order for them to produce this value an input purchase of $6.3 million from the fertilizer sector was required, roughly 9.5 percent of gross revenue, $4.0 million from the petroleum sector (6.1 percent), $2.1 million from the chemical sector (3.2 percent), $3.0 million from the machinery and equipment sector (4.5 percent), $2.0 million from the wholesale trade sector (3.1 percent), $4.7 million from its own sector (7.1 percent), $2.8 million from the financial sector (4.3 percent), and $4.6 million from the real estate rental sector (7.0 percent). Thus inputs total $33.6 million worth of products from other industries and value added totalled $32.7 million in the form of wages, returns to labour, management, land and taxes.

Wide variations in the proportions of value added to gross revenue were found both among and within each industry group. In particular, the petroleum refinery industry, with its high capital-intensive operation, showed a heavy dependence upon crude oil, and other produced inputs for its production activities and these accounted for almost 86 percent of the total revenue. Only 14 percent of the revenue went as factor income to labour and capital.

Since the purchases made by one industry necessarily constitute the sales or markets of the selling industries, the technology flow table not only provides information on the input structure of an individual industry,

but also the market or disposition pattern of a product. In other words, if the intermediate purchases of one product are summed across all industries, the total value of the intermediate use of that product, or alternatively, the proportion of intermediate use to final disposition, can be determined. Suppose, for a certain product, 30 percent of its production is sold to other sectors as intermediate goods for further processing and 70 percent goes to final consumption or export, then the economic importance of this product is more as final consumption than as raw input to other industrial activities.

Regional Income and Expenditures

GNP accounts, which consider only the value added on the production accounts and final demand on the expenditure account, can be constructed from the I-O system of the NSRB. The region's economic characteristics can also be analyzed in terms of domestic production and regional expenditure patterns, as adopted by National Income Accounts. A brief explanation of the accounting interrelationship between the I-O and GNP system follows. The total value of all industry outputs from the I-O table is composed of either intermediate inputs in terms of commodity basis or primary inputs in terms of factor income when considered as input purchases. The total value of commodity outputs is to be allocated either as intermediate inputs or final demand inputs, when viewed from an allocative perspective. An accounting identity is used that says,

on an aggregate basis, the value of total industry outputs must equal the value of total commodity outputs. For the value of each commodity produced within the region's economy, there corresponds an equivalent amount of industry output registered either as primary production or secondary production. Intermediate inputs are common to both industry account (or product account) and commodity account (or allocation account), and when netted out from both accounts, it is apparent that primary input (GDP) equal the disposition on final expenditure (GDE). Because government factor income is entered outside the endogenous sector of the I-O system, this item is added to both sides of the above relationship to yield a complete regional GDP account.

For the region as a whole, the total income, as measured in terms of GDP, amounted to about $3,777 million, or roughly 44.6 percent of the provincial total. This included wages, salaries, rents, interest, dividend, and taxes paid to all factor owners regardless of where they resided. THat is, this GDP concept is slightly different from the GNP concept in that the former should be adjusted in accordance with the amount of net flow of factor income paid to non-residents of the region. Although the analysis of regional income and expenditures thus requires the flow of factor income between residents and non-residents of the region under study, the data of which is lacking at present, the broad features of the basin economy can be outlined using the income-expenditure framework as derived

from the I-O system of the region.

Of the total GDP of $3,777 million in 1972 for the NSRB region, about 72.5 percent or $2,739 million was spent on consumption expenditures, including both durable and non-durable consumer goods as well as various services, whereas 27.2 percent or $1,026 million was used for capital accumulation in such investments as machinery, building and structures, with exports and imports roughly being balanced at $1,090 million or 28 percent of the GDP. Since this external trade was almost balanced, it appears that domestic savings would equal domestic investment, and therefore the ratio of domestic saving would also be 28 percent of the GDP. Of the total consumption expenditures, 85 percent or $2,236 million was accounted for by the private sector and the remaining 15 percent or $421 million by the government sector. As for investment expenditures, the portion of total investments undertaken by the private sector was 89.0 percent of the total and the rest, 11.0 percent, by government sector.

The trading pattern of the region indicates the comparative advantage of producing a certain commodity vis-a-vis production outside the region. A region will tend to export a commodity for which it possesses a comparative cost advantage, while it will import a commodity for which it has the least advantage or most disadvantage in comparison with the rest of Canada or the rest of the world.

The NSRB, as revealed by the pattern of external trade with the outside region, exported a total of $1,093

million to its external markets, of which $666 million or approximately 61 percent was in crude oil, natural gas and petroleum refined industries. Of the total export earnings, $178 million or 16.3 percent were accounted for by agricultural products. These two sectors comprised almost 80 percent of the total export earnings, thus being the dominant export sectors of the region. In other words, the economic advantage of the region appears to lie in the resource-related industries such as agriculture, oil and gas related industries (Table 3-5).

TABLE 3-5

SELECTED MAJOR EXPORT COMMODITIES, NSRB, 1972
(millions of dollars)

Commodities	Value	% of Total Exports
Crude oil	466	42.6
Beef and meat prod.	124	11.3
Natural gas	117	10.7
Petroleum refined	80	7.3
Barley	67	6.1
Wheat	54	4.9
Electric power	53	4.8
Fertilizers	47	4.3
Other grains	38	3.5
Oilseeds	19	1.7
Sulphur	3	0.3
SELECTED TOTAL	1,068	97.7

Note: Values refer to only net trade flows, i.e., exports less imports.

Source: As estimated from the regional input-output tables, NSRB, 1972, based on commodity balances for each sector.

In return for these exports, the region had to import almost an equivalent amount of goods and services totalling $1,085 million, of which more than 94 percent or $1,020 million was highly manufactured goods such as vehicles, machinery, electric and other appliances, clothes, etc. (Table 3-6).

TABLE 3-6

SELECTED MAJOR IMPORT COMMODITIES, NSRB, 1972

(millions of dollars)

Commodities	Value	% of Total Imports
Vehicles and others	170	15.7
Machinery and equip.	158	14.6
Appliances, electr.	116	10.7
Clothes	91	8.4
Metal fabricated	82	7.6
Iron and steel prod.	73	6.7
Livestock	72	6.6
Misc. manufacture	68	6.3
Pulp and paper prod.	59	5.4
Textile	34	3.1
Chemical prod.	32	2.9
Lumber and plywood	29	2.7
SELECTED TOTAL	1,005	92.6

Note: Values refer to only net trade flows, i.e., imports less exports.

Source : As estimated from the regional input-output tables, NSRB, based on commodity balances for each sector.

Thus, the cost disadvantage of the NSRB seems to lie in manufactured goods, in particular, vehicles and machinery.

It appears that the NSRB region trades high resource-content commodities for highly processed manufactured goods and that the regional economy is still immature. Since the income-generating capacity via industrial linkages is greater with manufactured goods than with primary resource products, the policy implication is that positive measures may be required to encourage import-competing industries, or at least to ensure maximum possible processing of the resource-related products, if the goal of policy makers is to maximize the impacts on regional income.

Impact Table and Multiplier Analysis

Gross Output Multiplier

This multiplier refers to a total change in the value of production required for all related industries resulting from an initial increase in final demand for a commodity. It should be noted that all the output requirements induced by an initiating industry are measured in terms of gross values, not in factor income generated.

The impact multiplier table is one of the most powerful analytic tools that can be derived from an input-output model. It sums up the total impacts of output change in one sector upon industries interlinked throughout the

economy by measuring the direct and indirect requirements from each sector in order to fulfill a unit increase in final demand for a commodity. For an economic system as a whole, the table indicates the economic balance that must be maintained between final consumption and domestic production.

Before analyzing the impact table derived from the NSRB regional I-O accounts, several problems related to interpretation of results and quality of data should be noted. Firstly, an input-output flow table indicates forward and backward linkages with reference to one particular sector. In other words, one can identify not only the composition of input-supplying sectors required for operation of this sector, but also the major customers of the product or simply where the products are sold. For example, if one takes the appropriate column of the transaction flow table for the livestock industry, it can be seen that this industry required hay and forage as feed, chemicals, electricity etc. from industries supplying these inputs. Furthermore, by reading across the appropriate row for livestock, it can also be seen that the livestock product is mostly sold to meat processing plant, or exported outside the region. However, by definition of the input-output model, the impact multiplier for the livestock industry, as calculated from matrix inversion,

only gives the total impacts on outputs of all industries which are backward-linked to the livestock industry. Thus this multiplier does not take into account the effects associated with outputs of forward-linked industries, in this case, the effect on the meat processing industry. If one is interested in tracing the effects on the forward-linked meat processing industry, one must use the column of the industry that is most forward-linked to the industry in question.

A second point relates to so-called leakages from domestic production in relation to imports, inventory etc. In general, to the extent that imports or inventory withdrawal share with domestic production in the supply of a commodity, the impacts in terms of induced production on domestic output will be reduced. Because of limited data on regional trade patterns, in particular, regional imports by commodity and inventory change, the leakages arising from imports or inventory have been ignored, and therefore the multipliers from the table should be regarded as having a maximum effect on domestic production.

If we classify each commodity into three major categories, i.e., high, medium, and low linkage groups according to the size of the total impacts on the rest of the economy, Table 3-7 is obtained.

TABLE 3-7

RANKING OF COMMODITIES BY GROSS OUTPUT MULTIPLIER

Commodities	Multiplier	Ranking
I. High Linkage Group (greater than 2.2)		
Beef, pork & meat	2.978823	1
Repair construction	2.734205	2
Dairy products, proc.	2.730044	3
Eggs in shell	2.655326	4
Poultry prod.	2.655326	4
Feeds manufacture	2.653787	5
Flour,cereal & bakery	2.434552	6
Petroleum refined	2.368953	7
Appliances, electric	2.359574	8
Other foods, n.e.s.	2.346873	9
Milk, dairy prod. unpr.	2.346524	10
Other primary metal	2.335441	11
Iron & steel prod.	2.335441	11
Hosiery & knitted	2.304123	12
Livestock	2.301149	13
Textile	2.259789	14
Clothing	2.245624	15
Metal fabricated	2.237050	16

TABLE 3-7 (continued)

II. Medium Linkage Gr. (1.75 - 2.20)		
Water & other Utilit.	2.194909	17
Vehicles & other	2.192298	18
Machinery prod.	2.183812	19
Leather prod.	2.171441	20
Wood products	2.171158	21
Lumber & plywood	2.171158	21
Vegetable oil prod.	2.166251	22
Furniture & fixture	2.139111	23
New construction	2.094876	24
Pulp & paper	2.093586	25
Chemical products	2.062025	26
Barley	2.056717	27
Tires & tubes	2.035074	28
Other rubber prod.	2.035074	28
Soft drinks	2.021912	29
Fertilizers	1.998469	30
Miscel. manufact.	1.951515	31
Wheat	1.951098	32
Beers & alcohol	1.930963	33
Other non-metallic	1.882932	34
Accomodation & food	1.843673	35
Hay & forage	1.833079	36
Printing & publish.	1.813426	37
Oilseeds	1.812259	38
Forest products	1.765283	39
Other cereal grains	1.751405	40

TABLE 3-7 (continued)

III. Low Linkage Gr. (less than 1.75)		
Cement	1.694087	41
Coal	1.685173	42
Other minerals	1.620418	43
Retail trade	1.618616	44
Storage	1.594314	45
Personal services	1.577721	46
Education services	1.560575	47
Natural gas	1.530994	48
Crude oil	1.530994	48
Sulphur	1.530994	48
Electric power	1.478009	49
Other agri. prod.	1.462868	50
Wholesale trade	1.456599	51
Real estate rental	1.450068	52
Communication	1.419038	53
Health services	1.401461	54
Finance & insur.	1.381444	55
Transportation serv.	1.339005	56
Fishing, hunting & tr.	1.293893	57
Business services	1.276001	58
Gas pipeline serv.	1.204679	59

Source : As derived from the regional I-O impact table, NSRB, 1972.

The commodity with the highest impact multiplier was found to be beef and meat products with a value of 2.98. An initial increase of $1.00 in beef and meat expenditure would result in a total increase of $2.98, including both direct and indirect effects, throughout the economy via industrial linkages. In other words, an initial increment in this expenditure would trigger all the related input-supplying industries' purchases, thus stimulating production throughout the whole economy, with its total effect being summed as an impact multiplier of 2.98. Conversely, the gas pipeline transportation services sector has the least impact on the economy in terms of induced production for related activities with a ratio of 1.20.

In general, industries whose input supplies are heavily reliant on either the local agricultural sector or on oil and gas extraction activities would tend to have higher impact multipliers. This is probably because, with the regional economic base being resource-oriented, the induced production effects would be greater if a certain activity draws more on these sectors as their input. For instance, the multipliers for beef, pork and meat products (commodity # 18) , processed dairy products (commodity # 19) and manufactured feeds (commodity # 20), all tied to the resource based agriculture for their input supplies, ranged from 2.65 to 2.98, well above the average of 1.97.

The oil and gas extraction industry (i.e. mining) appears to have a relatively lower linkage effect, with a

multiplier of 1.53, than is expected, and refined petroleum products (i.e. manufacturing), which involves considerable processing and hence a large linkage effect, has a multiplier of 2.37. Since the size of the impact multiplier generally depends on the degree of interindustry transactions in terms of the proportion of input requirements, the service industries, in general, tend to show a lower linkage effect compared to manufacturing industries because the proportion of material inputs for service industries is relatively lower or conversely value added is greater.

It is not so straightforward to attempt a direct comparison among different studies regarding the size of a multiplier due primarily to a different classification relating to sectorization and the different base year of compilation. Nevertheless, when comparing the multipliers for major sectors in our study with those derived in other studies, particularly with the South Saskatchewan River Basin study[1] and the Wright study,[2] it can be seen that the multipliers of our study, especially for those resource sectors of regional importance, are generally in line, as indicated in Table 3-8.

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[1] T. W. Manning and A. W. Anderson, South Saskatchewan River Basin Study : Phase I, University of Alberta, Edmonton, 1978.

[2] R. A. Wright, The Alberta Economy : An Input-Output Analysis, University of Calgary, Calgary, 1966.

TABLE 3-8

SELECTED MULTIPLIERS COMPARISON

Sectors	NSRB	SSRB	Alberta
Livestock	2.30	2.18[a]	1.57[b]
Beef, pork & meat process.	2.98	3.47	2.34
Mining-- oil and gas	1.53	1.91	1.33
Petroleum refinery	2.37	2.57	2.06
Trade[c]	1.62	1.65	1.17[d]

Notes : (a) represents feed cattle and calves.
(b) denotes the multiplier for agriculture in general because no sectoral breakdown is available.
(c) represents retail trade.
(d) denotes service sector as a whole since sectoral multiplier for trade is not available.

Sources : NSRB I-O Accounts, Table C-5 in Appendix C below; and T. W. Manning and A. W. Anderson, South Saskatchewan River Basin Study : Phase I, University of Alberta, Edmonton, 1978; R. A. Wright, The Alberta Economy : An Input-Output Analysis, University of Calgary, Calgary, 1966.

The impact multipliers calculated above provide a set of useful economic criteria in evaluating project feasibility through a benefit-cost framework because they represent a measure of maximum benefit induced by or stemming from direct project implementation, assuming the economy is operating below its capacity.

CHAPTER IV

INTERACTIONS BEWTEEM WATER AND THE ECONOMY

Water Use and Economic Activity

Historically, water has been a key factor of production. Where water facilitated production, the economy generally flourished. In Alberta, the provincial economy has grown in real terms more than three-fold over the 20 year period, 1952 - 1972. It can be assumed that water use has grown with the rate of economic growth, or possibly faster because (1) water has been considered a public good and has been provided free or for a token fee, and (2) the rapid development of modern technology has resulted in an increased per-capita consumption of water.

The total quantity of water withdrawn for all uses in Alberta in 1972 (including municipal, industrial, commercial and irrigation uses, but excluding thermal generation, recreational and other environmental uses) was estimated at 452,000 million imperial gallons. The crude percentage distribution of this water was 76 percent for irrigation, followed by industrial (15 percent), and domestic/municipal (9 percent). Given that GDP for Alberta in 1972 was $8,470 million, the ratio of water use per unit of economic activity was 53 gallons of water per

dollar of GDP. Since most water use was for irrigation, water use per dollar of GDP in the rest of the economy, excluding the irrigation sector, was much lower.

The sources of water to supply these total provincial water requirements were from surface flows (80 percent) and groundwater (20 percent). There is wide seasonal variations in surface flow due to the dependency on the snow melt in the Rocky Mountains. For example, a peak flow for the month of June in the North Saskatchewan River can be 13 times higher than in February, the low flow month. Although water shortage in the North Saskatchewan River System is not expected to become critical in the near future, increasing industrial activities, high population growth, and increasing public awareness of the environmental requirements for water suggest that the water balance of the basin should be carefully assessed to forestall water-related problems that may arise.

Analysis of Industrial Water Use Survey, 1972

The 1972 Industrial Water Use Survey was undertaken by Alberta Environment to obtain information regarding water intake, consumption, discharge and recirculation by major industrial water users in Alberta. This information is critical for establishing a water resource management plan on a province-wide basis. This survey was limited to industrial water users only; other major users such as domestic (household uses), agricultural (mostly irrigation), stock-

watering and commercial uses were excluded. Also, the survey did not account for the fresh water used for enhanced oil recovery purposes by oil and gas operators. The data was analyzed to indicate water use characteristics throughout the province as well as to provide detailed breakdowns by river basin and by sources of supply.

The survey indicated that the total water intake for the province was 355,668 million imperial gallons in 1972, of which 343,324 million gallons, or roughly 97 percent, were discharged back to the system. The remaining 3 percent, or 12,344 million gallons, was consumptively used (Table 4-1).

TABLE 4-1

WATER INTAKE, DISCHARGE AND CONSUMPTION
ALBERTA, 1972
(million imperial gallons)

	Intake	%	Discharge	%	Consumpt.	%
Mining	13,352	3.8	7,378	2.1	5,974	48.4
Manufacturing	44,771	12.6	38,732	11.3	6,039	48.9
Power gener.	297,545	83.7	297,214	86.6	331	2.7
TOTAL	355,668	100	343,324	100	12,344	100

Note : Mining does not include water uses by oil and gas industries.

Source: Alberta Department of Environment, Industrial Water Use Survey, 1972 (Edmonton : 1974).

However, the results indicated in Table 4-1 are somewhat general, for the following reasons: (1) the power generation sector dominates the other economic sectors in terms of the total water intake and discharge, accounting for almost 84 percent of the provincial total; (2) the power generation sector has an insignificant rate of consumptive use; (3) the major oil and gas industries were not surveyed; and (4) domestic and irrigation water uses were not covered in the survey.

Given these qualifications, analysis of the results indicates that, on a major river basin basis, and excluding water uses for power generation, the South Saskatchewan River Basin, provided the largest volume of water intake, withdrawing almost 48.4 percent of the provincial intake, followed by the Athabasca River (26.7 percent), North Saskatchewan River (21.4 percent), Peace River (2.4 percent) and Red Deer River (1.1 percent). In terms of consumptive use, which is a more relevant indicator of net resource input for economic activities, the Athabasca River Basin provided 41.2 percent of the total consumptive use, followed by the North Saskatchewan (29.3 percent), South Saskatchewan (24.4 percent), Peace River (4.2 percent) and Red Deer River (0.9 percent).

On an industrial activity basis, excluding thermal power uses, the chemical industry was the largest water user of all manufacturing industries, accounting for 42.3 percent of the total intake, followed by petroleum and coal refineries (20.5 percent), pulp and paper (18.2 percent), and food and

beverages (12.6 percent).

The way water is related to production processes is measured not only by the amount of water withdrawn but also by the degree of recirculation within the manufacturing processes. For all manufacturing industries combined, the total volume recirculated was roughly four times the initial intake, implying that the same quantity of water was used approximately four times throughout the system for industrial production purposes before it was finally discharged. The chemical industry had the largest recirculation rate, about 62.6 percent of the total recirculated, followed by primary metal (17.3 percent), petroleum refinery (11.5 percent), and food and beverages (5.2 percent).

Water Intake Coefficients

Different economic activities require different amounts of water during production processes, depending on the type of activity, degree of cooling requirements, etc. The average relationship between water input and economic activity may be represented by a parameter called the "average water intake coefficient". This is obtained by dividing total annual water intake of a particular industry by its total annual value of production. It thus measures, for example, X million imperial gallons of water used per million dollars worth of production of Y commodity. If sufficient time series data were to exist to allow us to examine the change in time trend of water intake coefficients, a variable coefficient may be utilized to reflect a change

in water-using technology; however, only the 1972 water use survey is available, and it is assumed that the water intake coefficients generated from this survey would prevail during the period of study, 1980 and 1985.

Table 4-2 shows the average water intake by industry, as measured in terms of millions of imperial gallons of water for every million dollars worth of industrial production. This is a relative measure relating quantity of water to the dollar value of production. Therefore, a high value indicates that water intake is comparatively high in relation to the value of production with which it is associated. Alternatively, the value of the product for which water is used may be comparatively lower than that of other products, or the water intake itself is relatively higher than in the case of production of other industrial products. The reciprocal of this parameter can represent a measure of (single) factor productivity, i.e., water productivity, relating the dollar value of production to the quantity of water required. Just as labour productivity shows the dollar value per man-hour, water productivity indicates the dollar value per unit of water utilized.

As can be seen in Table 4-2, industrial activities with water intake coefficients were the chemical and related industries, other mining industries, and the leather industry. Values ranged between 45.2 and 20.0, indicating

TABLE 4-2

WATER INTAKE COEFFICIENTS BY INDUSTRY, NSRB

(million imperial gallons/1972 million dollars)

Industry	Value
Wheat	0.0
Barley	0.0
Oilseeds	0.0
Other grains	0.0
Forage	0.0
Livestock	23.8681
Poultry & eggs	5.0581
Dairy prod. unproc.[1]	0.0448
Other agri prod.	0.0943
Forestry products	0.0410
Fishing, hunt. & trap.	0.0
Coal	0.1869
Petroleum, crude & gas	13.4218
Other mining	32.0329
Slaughter & meat proc.	3.7003
Dairy products, proc.	2.0575
Feeds, manufact.	10.3472
Flour, cereal & bakery	0.6024
Vegetable oil mills	0.2083
Soft drinks	9.8058
Breweries & alcohol	4.6371

TABLE 4-2 (continued)

Industry	Value
Other foods, n.e.s.	1.8518
Rubber manufacture	0.1515
Leather manufact.	20.0
Textile	0.3306
Hosiery & knitted	0.0
Clothing	0.1869
Wood products	0.3927
Furniture & fixture	0.1974
Pulp & paper	0.9091
Printing & publish.	0.0880
Primary metals	17.8235
Metal fabricated	4.6657
Machinery	0.1600
Transportation equip.	0.6228
Electrical appliances	1.0
Cement	7.3585
Concrete products	1.3282
Ready-mix concrete	1.8222
Other non-metallics	1.9540
Petroleum, refined	11.1912
Fertilizers	11.6051
Chemical products	45.2270
Miscell. manufact.	5.6989
New construction	0.0715
Repair construction	0.0175
Transportation services	0.0982
Storage	3.3015
Communication	0.2349
Electric power	2.2003

TABLE 4-2 (continued)

Industry	Value
Gas pipeline distr	0.1646
Water & other util	0.0
Wholesale trade	1.1604
Retail trade	0.7274
Finance & insur.	0.1105
Real estate rentals	0.0647
Education services	0.1290
Hospital & health	0.5143
Accomodation & food	1.3891
Business services	0.2222
Personal services	0.2800

Note: This estimate may be low.
Sources: As estimated using data on water from Alberta Environment, Industrial Water Use Survey, 1972 and data on production from the regional I-O tables, NSRB, 1972.

that to produce one million dollars worth of product, approximately 20 to 45 million gallons of water were required. Conversely, these sectors had low value factor productivity, because the value produced per gallon of water used was low. Industrial activities requiring the least amount of water per unit of production were forestry products (0.0410), repair construction (0.0175), and real estate rentals (0.0647).

The major grain crops such as wheat, barley, oilseeds, and other grains etc. were assumed to require no water because there is no significant development of irrigation agriculture in the NSRB.

Since part of the water withdrawn for productive purposes may be discharged back to the river system after its use, the factor resources required solely for consumptive uses, i.e., the amount of water completely removed from the supply by the productive processes, may be a more appropriate parameter for developing a water resource management plan. For this purpose, water consumption coefficients by industry were developed (Table 4-3).

The ranking of water-using industries by intake coefficients is somewhat different than the ranking by consumption coefficients because of variation in the proportion of water consumed to the amount withdrawn. For example, the primary metal, other mining, leather, fertilizer manufacturing, and chemical industries, although high water intake users, were ranked below industries such as livestock, crude oil and natural gas extraction, because their consumptive

TABLE 4-3

WATER CONSUMPTION COEFFICIENTS BY INDUSTRY, NSRB

(million imperial gallons/1972 million dollars)

Industry	Value
Wheat	0.0
Barley	0.0
Oilseeds	0.0
Other grains	0.0
Forage	0.0
Livestock	23.8681
Poultry & eggs	5.0581
Dairy prod. unproc.[1]	0.0448
Other agri prod.	0.0
Forestry	0.0
Fishing, hunt. & trap.	0.0
Coal	0.0093
Crude oil & nat. gas	12.4028
Other mining	0.0
Slaughter & meat proc.	0.5543
Dairy prod. processed	0.5088
Feeds manufacture	0.6250
Flour, cereal & bakery	0.0602
Vegetable oil mills	0.1042
Soft drinks	1.5534
Breweries & alcohol	0.7258
Other food, n.e.s.	0.3704

TABLE 4-3 (continued)

Industry	Value
Rubber industry	0.0
Leather industry	0.0
Textile	0.3306
Hosiery & knitted	0.0
Clothing	0.0
Wood products	0.2618
Furniture & fixtures	0.0
Pulp & paper	0.3788
Printing & publish.	0.0293
Primary metal	10.3333
Metal fabricated	1.2945
Machinery	0.0400
Transportation equip	0.1384
Electrical appliance	0.0
Cement	6.9182
Concrete products	0.8084
Ready-mix concrete	0.4444
Other non-metallic	0.6897
Petroleum, refined	2.9243
Fertilizers	6.7898
Chemical products	12.9569
Miscellaneous manufact	0.5376
New construction	0.0135
Repair construction	0.0
Transportation services	0.0
Storage	0.0

TABLE 4-3 (continued)

Industry	Value
Communication	0.0
Electric power	2.2003
Gas distribution	0.0
Water & other util.	0.0
Wholesale trade	0.0753
Retail trade	0.0455
Finance & insur.	0.0070
Real estate rentals	0.0207
Education services	0.0403
Hospital & health	0.0381
Accomodation & food	0.1105
Business services	0.0
Personal services	0.0

Note: (1) This estimate may be low.

Sources : As estimated using data on water from Alberta Environment, Industrial Water Use Survey, 1972 and data on production from the regional I-O table, NSRB, 1972.

uses were relatively low. The crude petroleum and natural gas industry is a major consumptive user, not only in terms of absolute amount of water consumed, but also in relation to the unit value of production.

Water Use Interaction Matrix and Water Multipliers

An increase in production activity of an industry creates not only its own demand for water for production processes but also indirect demands for water in other sectors of the economy through technical interrelationships. The extent of indirect demands generated throughout the economy would essentially depend on the degree of industrial interdependence and the degree to which the industry is related to the water-intensive sectors. For instance, the meat processing industry requires a considerable amount of water for its own production activities; however, there is also an indirect demand for water of substantial quantity associated with raising livestock that must be supplied to the meat processing industry as a major material input. Therefore, in order to accurately reflect the total water requirements involved in the delivery of a unit value of meat products, it is necessary to include both direct and indirect requirements induced by an initial change in final demand.

Technically, the quantitative relationship of structural interdependence between producing sectors that

must be maintained in order to deliver a unit value of product to the final demand sector is succinctly summarized in an impact multiplier matrix (or impact table) that relates both sectoral and total output impacts on the economy arising from a unit change in final demand. This is typically represented by a matrix $R = [\ r_{ij}]$, where an element r_{ij} indicates the output impact on industry i of an initial increase in final demand for commodity j. Since the sectoral output impacts r_{ij} can be translated via a water matrix w_{ij} into a corresponding quantity of water, superimposing a water matrix $[\ W_{ii}]$, arranged in a diagonal matrix, upon an impact table [R], would give us a new matrix $Q = WxR$, which shows sectoral water impacts as well as total water impacts resulting from a unit value increase in final demand for a commodity. For example, an element q_{ij} represents the amount of water directly or indirectly required for industry i as a result of an increase in final demand for commodity j. This element will be measured in terms of millions of gallons per million dollars. The resultant matrix Q is often called a "water use interaction table" because it shows the interdependency of one sector on another in terms of water quantity required, including <u>both</u> direct and indirect effects via technical linkages, as corresponding to a unit value increase in final demand. The value of the water interaction table $[\ q_{ij}\ ]$ thus hinges on (]) the value of the impact table r_{ij}, or ultimately on technological linkages $[\ b_{ij}\ ]$, and

(2) water using technology as shown by [w_{ij}]. Other things being equal, the higher the industrial linkages, and the higher the water intensity of production activities to which the industry is related, the higher the total water requirements induced by an initial change in demand.

The water use interaction table estimated for the NSRB economy, using 1972 data, is presented in detailed form in Table C-6, Appendix C, and is summarized in Table 4-4. The column sum for any commodity in the water use interaction table represents the total water impact--that is, the water content directly or indirectly associated with production of the commodity. The water use interaction table provides an integrated view of the structure of the water economy for the NSRB region. For example, from Table C-6 in Appendix C, reading down the column of this table, each entry shows the amount of water required by each industry sector on the left in response to a unit change in final demand for the commodity on the top. When summing over all elements in a column of the table, the column sum measures the total amount of water induced by a unit change in final demand for the commodity in question.

Referring to a specific commodity from Table C-6 above, and reading down column 18 (beef and meat products), it can be seen that virtually all water demands of all sectors are affected by a unit change in demand for beef and meat products. Specifically, the industries that receive most water impacts as demand changes in beef and

TABLE 4-4

WATER IMPACTS BY COMMODITY

AND WATER MULTIPLIERS

(million imperial gallons/1972 $million)

Commodity	Total Water Impact	Direct Water Coefficient	Multiplier
Wheat	7.0960	0	*
Barley	9.5473	0	*
Oilseeds	6.4971	0	*
Other grains	6.0013	0	*
Hay & forage	6.3468	0	*
Livestock	28.8235	23.8681	1.21
Poultry	17.7831	5.0581	3.52
Eggs in shell	17.7831	5.5081	3.52
Dairy, unproc.	8.2287	0.0448	183.68
Other agri prod.	1.5032	0.0943	15.94
Forestry	3.0790	0.0410	75.10
Fishing, H & trap.	2.2586	0	*
Coal	3.5174	0.1869	18.82
Crude oil	16.0589	13.4218	1.20
Natural gas	16.0589	13.4218	1.20
Sulphur	16.0589	13.4218	1.20
Other minerals	35.4426	32.0329	1.11
Beef & meat prod.	26.3890	3.7003	7.13
Dairy prod proc.	8.5944	2.0575	4.18
Feeds manufact.	20.4924	10.3472	1.98
Vegetable oil	5.7306	0.2083	27.51

TABLE 4-4 (continued)

Commodity	Total Water Impact	Direct Water Coefficient	Multiplier
Flour, cereal & bake	6.5300	0.6024	10.84
Soft drinks	14.9524	9.8058	1.52
Beers & alcohol	9.1619	4.6371	1.98
Other foods, n.e.s.	7.8813	1.8518	4.26
Tires & tubes	16.6180	0.1515	109.69
Other rubber prod.	16.6180	0.1515	109.69
Leather products	32.4848	20.0	1.62
Textile	16.1340	0.3306	48.80
Hosiery	8.5579	0	*
Clothes	5.1614	0.1869	27.62
Lumber & plywood	5.1957	0.3927	13.23
Wood products	5.1957	0.3927	13.23
Furniture & fixture	7.5732	0.1974	38.36
Pulp & paper	7.8865	0.9091	8.68
Printing & publish	3.7153	0.0880	42.22
Iron & steel	36.3134	17.8235	2.04
Other primary metal	36.3134	17.8235	2.04
Metal fabrication	19.4584	4.6657	4.17
Machinery	8.9367	0.1600	55.85
Vehicles & other	9.3567	0.6228	15.02
Electric appliances	12.5483	1.00	12.55
Cement	13.0175	7.3585	1.77
Other non-metal min.	10.2990	1.7014	6.05
Petroleum refinery	24.8866	11.1912	2.22
Fertilizer	21.5201	11.6051	1.85
Chemical products	59.7077	45.2270	1.32

TABLE 4-4 (continued)

Commodity	Total Water Impacts	Direct Water Coefficient	Multiplier
Miscellaneous Manuf	18.0255	5.6989	3.16
New construction	8.4583	0.0715	118.30
Repair construction	13.8740	0.0175	792.80
Transportation serv.	1.9162	0.0982	19.51
Storage	5.7375	3.3015	1.74
Communication serv.	1.5869	0.2349	6.76
Electric power	4.0787	2.2003	1.85
Gas distribution	0.9740	0.1646	5.92
Water & util.	6.5235	0	*
Wholesale trade	3.0253	1.1604	2.61
Retail trade	4.0874	0.7274	5.62
Finance, Insur.	1.5912	0.1105	14.40
Real estate rental	1.8420	0.0647	28.47
Education	2.7688	0.1290	21.46
Health	3.0658	0.5143	5.96
Accomodation & food	6.0530	1.3891	4.36
Business services	1.1406	0.2221	5.13
Personal services	4.3033	0.2800	15.37

Note: * refers to the fact that because of the negligible amount of water intake involved for this sector, the multipliers cannot be defined.

Source: As estimated from Table C-6, Appendix C and Table 4-2, in I-O tables, NSRB, 1972.

meat products are the livestock, meat processing, chemical, fertilizers, feed manufacturing, crude oil and natural gas, petroleum refinery, primary metal and other mining industries. The water quantities of these industries generated by an additional one million dollars increase in beef and meat products are estimated to be 17.41, 3.86, 2.42, 0.51, 0.42, 0.38, 0.31, 0.28, and 0.23 respectively, all measured in terms of million imperial gallons. The total water impacts on the basin economy arising from a one million dollar change in beef and meat products thus amounted to 26.40 million gallons, which, when compared with its own direct usage of 3.7 million gallons per one million dollars, implies a total 22.7 million gallons of indirect demands being generated throughout the basin economy. The total water impacts expressed in terms of million imperial gallons per million dollars, as they are ranked in descending order of magnitude, showed that, on an inter-industry basis, the chemical industry was the highest with 59.71, followed by iron and steel (36.31), other mining (35.44), leather (32.48), livestock (28.82), beef and meat products (26.39), petroleum refinery (24.89), fertilizer (21.52), feeds manufacture (20.49), metal fabrication (19.46), miscellaneous manufacture (18.03), poultry and eggs (17.78), rubber products (16.62), and crude oil and natural gas (16.06). On the other hand, some of the industries with the least water impacts are gas pipeline service (0.97), business service (1.14), and communication service (1.59). It is generally observed that some of commodities with the

largest water impacts tend to be associated with those with high values of multiplier effects from industrial linkages; however, this does not hold true for all commodities, because it can also vary with the level of water-using technology that production processes are using.

A water multiplier relates a unit change in direct water usage of an industry to total water impacts throughout all sectors of the economy. These comprise both direct and indirect requirements due to the induced water usages called upon by all input-supplying sectors to the industry. The proportion by which total water requirements exceed the initial direct requirement is called a "water multiplier", because it represents a factor by which the initial amount must be multiplied to obtain the total requirements associated with commodity production. Technically, it is computed as

$$\sum_{i=1}^{m} q_{ij} / w_j$$

That is, the sum of water quantity required by each industry in producing a unit of the jth commodity divided by the direct coefficient w_j.

A high water multiplier implies that an industry's operation will have large water demands placed upon other sectors of the economy relative to its own demand. This is

because (1) either the industry is technologically linked more closely to water-intensive sectors such as the chemical, pulp and paper, iron and steel, livestock or leather industries, or (2) the direct water coefficient for its own use is very low.

Water multipliers, as estimated for the NSRB, are given in Table 4-4. It is apparent from this table that high water multipliers were associated with repair construction (792.8), dairy products, unprocessed (183.7), and the rubber industry (109.7) These industries had very low water coefficients for their own operations and/or they are technically tied to high water using sectors for their input. For example, about 85 percent of the multiplier value of 109.8 for the rubber industry is explained by the fact that this industry draws heavily on a water-intensive user, the chemical industry, for its inputs. Most industries with high direct water coefficients, such as livestock, leather, primary metal, chemical and fertilizers, mining and petroleum refinery, etc. had water multipliers of only 1.1 to 2.2. It appears that these industries, being high water users themselves, may not create much multiplicative effect on the rest of economy. Also, although the direct water requirements of grain producers are assumed to be nil due to the absence of irrigation agriculture, these producers are associated with approximately six to nine million gallons of water per million dollars of output when analyzed on an interindustry basis, because of the

indirect requirements for chemical and fertilizer products that are required for agricultural production.

Project Evaluation and Policy Implications

The economic parameters of the I-O methodology are useful for developing a framework for a water use projection model, and particularly useful to provide a measurement device for evaluating water resource projects. The major policy uses of the economic parameters such as impact multipliers, water intake coefficients, the water use interaction table, and water multipliers are : (1) in assessing the economic feasibility of proposed resource projects, it lends itself to the measurement of economic benefits, in particular, secondary benefits accruing from the project; (2) in considering the possible industrial location, it can serve as a management tool in determining the overall resource balance in the future within a region, given the proposed level of economic activity; (3) it can provide a basis for identifying the sectoral income and water impacts throughout the regional economy originating from a proposed plant operation, which would be essential for establishing a regional water management strategy; and (4) it also can be useful for formulating a policy decision regarding selection of an industrial activity to optimize resource use while maximizing the income effects upon the economy.

The investment criterion assumes that resources devoted to water development projects are to be utilized as efficiently as those in other sectors of the economy. In other words, the marginal return on additional investment in water projects should be at least as high as those obtainable from other sectors of the economy.

Benefit-cost analysis is often used to determine the economic efficiency of water resource investment projects.[1] Such projects usually generate income or benefit streams that extend over a long period of time and stretch beyond the direct project outputs. The analyst must quantify both the primary benefits of the project and also the secondary effects stemming from or induced by the project output.[2] An input-output table for the region under study, through its impact multiplier matrix, provides a quantitative measurement of secondary benefits that may result. Thus, in determining the economic feasibility of proposed water resource projects, an input-output table,

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[1]For standard references dealing with benefit-cost analysis related to water resource projects, see Otto Eckstein, Water Resource Development : The Economics of Project Evaluation, (Cambridge : Harvard University Press, 1958), and C. W. Howe, Benefit-Cost Analysis for Water System Planning, (Baltimore : Publication Press Inc. 1971).

[2]Secondary benefits should only be counted as efficiency benefits if resources are less than fully employed.

particularly the inverse matrix, may provide a useful device for the measurement of benefits in the evaluation process.

The water input coefficients that relate water quantity to level of production indicate which sectors or industrial activities will be compatible with the existing and anticipated supply of water. Conversely, given the expected level of economic activities in the future, water requirements can be projected, thus enabling the water planners to establish the future supply alternatives to meet the anticipated demands.

If the policy maker, taking a province-wide accounting stance, is interested in assessing total impacts on water resources resulting from any particular industrial activity, the water use interaction table will identify sectoral and overall impacts on water resources originating from a change in the output of this industry. Furthermore, if a closed economy is assumed, the water multiplier table, which includes both direct and indirect requirements, will determine the total water balance of the province, something that is sometimes obscured when only direct requirements are considered.

Regarding setting of priorities with respect to choice of industrial location, if a region under consideration is scarce in water resources, a priority might be given to the industry having a high income effect per unit of water used, taking into account both direct and indirect income generated, vis-a-vis the water quantity required by the initial industry.

CHAPTER V

PROJECTIONS OF FUTURE WATER DEMAND FOR 1980 AND 1985

This chapter provides projections of water requirements for the basin, based on the input-output models empirically estimated in chapters III and IV, and assuming several scenarios of final demands.

Projections of water requirements were developed by: (1) hypothesizing three realistic ranges of growth for each of the final demand categories on the basis of past trends and future projections; (2) calculating output projections on an inter-industry basis as consistent with each set of final demand scenarios developed for 1980 and 1985 by means of the inverse matrix, R ; and (3) identifying water requirement projections for 1980 and 1985 on both a sectoral and total basin basis by utilizing the water-use interaction table, Q. The level of future water requirements for the basin were then compared to the available supply of water in the basin in order to identify any shortages or surpluses in water resources.

To estimate final demand in the future for the Alberta economy and its subset, the NSRB economy, it is useful to examine the Alberta economy in recent years relative to the Canadian economy, and to focus on those sectors that are considered to be prime movers of the economy, that is, so-called basic export industries whose

initiating forces will underlie the growth processes of the region. The trend of these basic export sectors will be specified, taking into account national trend factors and foreign market conditions anticipated during the projection periods.

During the period, 1961-1976, the Alberta economy outperformed the Canadian economy in terms of annual growth rates. The GDP of Alberta increased by roughly 6.5 percent per year in real terms, while Canada's GDP increased by 5.0 percent. During 1970-1976 only, the gap between the growth rates of two economies became more prominent due to Alberta's 7.3 percent annual growth compared to Canada's 4.6 percent. This is due largely to the fact that Alberta, with its sustained energy resource base and its export potential, especially following the 1973 oil crisis with higher oil prices, was able to maintain a growth pace above the national average. This in turn caused significant in-migration into the province. Equally important is the contribution to economic growth of the agricultural sector in the province which not only increased production gradually over time, but also responded favourably to foreign market developments, particularly after 1973.

This interaction between economic growth and population immigration has benefited the province in the sense that Alberta was able to acquire the necessary labour input without encountering potential labour bottlenecks; at the same time, this increased in-migration itself provided

a sufficient base for expansion of domestic markets, which in turn stimulated further economic activities of supporting industries.

Extending our horizon into the mid-1980's, the prospects for both Canadian and Alberta economies appear to be that the growth rates of both economies will likely begin to slow down to a moderate level of 3.0 to 4.0 percent per year, mainly because of anticipated weakening in external environments, in particular, the slowdown in the U. S. economy as well as the levelling off of the population and labour force.

Development of Economic Scenarios, 1980 and 1985

The basic considerations underlying final demand scenarios depend upon two factors. The first factor is the trend of the Canadian economy from a longrun perspective, in particular, with respect to major categories of national expenditure such as consumer durables, non-durables, machinery and equipment, construction and foreign trade. These projections have been recently updated by the Economic Council of Canada[1] and incorporate changes in the economic structure brought about by the 1973 oil crisis. Since the economic structure has been undergoing a drastic adjustment

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[1]Economic Council of Canada, Options for Growth, Twelfth Annual Review, (Ottawa : 1975).

process following the external shock inflicted by the oil crisis of 1973, any future scenarios, in particular, energy and its related products and its consumption pattern, should take this factor into account. In this regard, the Economic Council developed various scenarios that depend on combinations of assumptions regarding energy prices, population growth and growth projections of major trading partners. Although a specific scenario is meant to be associated with a specific rate of growth in each category of demand, the general theme of the projections is that the growth rate of GNP for Canada is expected to recover slightly from the 1966-1973 average of 5.0 percent to about 5.6 percent to 5.7 percent for the period up to 1980, and then to slow down to a level of 3.6 to 4.3 percent for the ensuing period of 1980-1985. This projection may be somewhat optimistic since actual growth recorded to 1978 is well below the projected level.

By demand component, residential construction and exports are expected to weaken due to a stabilizing population and less buoyant foreign economic conditions that are anticipated. Meanwhile, other investments and consumer expenditures in general are expected to gradually decelerate from the 1970's until the mid-1980's.

The second basic consideration in the scenarios is that the population trend of the province as compared to that of Canada will be an important determinant of future consumer expenditures. The population is important

in determining the demand factors for major final demand expenditures. In the 1980's Canada will likely experience slow population growth, probably around 1.1 percent per year, mainly due to the fertility rate levelling off and net immigration stabilizing. However, the growth rate of the Alberta population is expected to surpass that of Canada over the same period because in-migration will continue due to the massive resource development slated for the late 1970's and through the mid-1980's. The population of the province is forecast to grow at an average annual rate of 2.0 to 2.2 percent over the 1975-1985 period,[1] almost double that of the Canadian population during the same period.

Using these two factors, the final demand scenarios for the NSRB were developed for 1980 and 1985. The purpose of scenarios is to indicate the range of developments possible rather than to forecast a precise future. Consequently, three broad scenarios were developed utilizing the assumptions of population growth and projected growth rates of similar categories of final demand, as prepared by the Economic Council of Canada, i.e., (1) Low Growth, (2) Medium Growth, and (3) High Growth.

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[1]Alberta Bureau of Statistics, Population Projections Alberta, 1972 - 1985, (Edmonton : 1977).

The major basic export industries of the region that motivate the regional economy are oil and gas, petrochemicals, electricity, and agriculture, which together account for almost 80 percent of the region's export total. Regional growth thus depends ultimately on the performance of exports by these sectors. In view of this, these four sectors will be examined below in terms of their trends, recent developments, and future growth potential, with the objective of designing three plausible scenarios.

It should be noted that although export demand constitutes an overriding component of the total final demand for the basin, especially for the resource-based sectors which will be analyzed in the following sections, the development of final demand scenarios for these sectors is based on a measure of total final demands including regional consumption, investment and government expenditures.

Oil and Gas Extraction

The energy resources sector has been and will remain the prime driving force of the provincial economy into the foreseeable future. In view of this, the future development of this sector will greatly affect not only the growth potential of the regional economy but also the total requirements for water resources in the basin, due to its relatively water-intensive nature of resource extraction activities.

Since the 1973 oil embargo by OPEC countries

and the subsequent upsurge in world oil prices, the energy problem has emerged as one of the most important economic issues facing people. Alberta, as a major supplier of energy resources to Canada, became aware that these energy resources are non-renewable, and require efficient resource management policies to maximize the net social benefits from these depleting resources.

Conventional oil production in Alberta since the 1960's has increased at an annual rate of about 10 percent, presumably in response to a strong energy demand from both the U. S. market and Canada. However, with a peak production in 1973 of 522 million barrels, the oil production from conventional fields began to decline gradually to a level of around 380 million barrels in 1977, reflecting a state of gradual depletion of the existing reserves. The compensating positive factor offsetting this declining production of conventional oil can be found in the new tar sand development and discovery of heavy oil sand reserves in northern Alberta. The oil sand deposits including both tar sands and heavy oil sands are estimated to be 950 billion barrels,[1] of which 74 billion or 8 percent of the total is considered to be economically recoverable with surface mining. The remaining deposits will have to be extracted by so-called "in-situ" recovery methods because the overburden is 150 to 2000 feet deep (Table 5-1).

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[1] J. H. Nicholls and R. W. Luhning, "Heavy Oil Sand In-Situ Pilot Plants in Alberta," The Oil Sands of Canada-Venezuela, Canadian Institute of Mining and Metallurgy, 1978. pp. 527-37. This section made use of the information contained above.

TABLE 5-1

THE OIL SAND RESERVE ESTIMATE, ALBERTA

Overburden (feet)	Barrels (billions)
0 - 150	74
150 - 500	135
500 plus	741
TOTAL	950

Source: J. H. Nicholls and R. W. Luhning, "Heavy Oil Sand In-Situ Pilot Plants in Alberta," The Oil Sands of Canada-Venezuela, The Canadian Institute of Mining and Metallurgy, 1978.

The Athabasca deposit has the largest reserve, with an estimated 626 billion barrels or almost 66 percent of the total, followed by the Cold Lake deposit, with some 164 billion barrels; remaining reserves are in the Wabasca and Peace River region.

The importance of this new oil sand reserve can be observed by comparing the estimated total oil sand deposits of 950 billion barrels to the total proven conventional oil reserves of approximately 5.4 billion barrels. Even counting only the reserve (74 billion barrels) recoverable by surface mining, the oil sands contain approximately 14 times the conventional reserves.

Energy demand projections suggest that national energy requirements will increase by 3.0 to 3.5 percent per year until 1995. For instance, projections by the Economic Council of Canada[1] indicate an annual increase rate of 4.0 percent for the "Moderate Energy Price" scenario and 3.0 percent for the "High Energy Price" scenario. A projection by Imperial Oil Co. Ltd.[2] is that, between 1975 and 1995, Canada total energy demand will grow at an annual rate of 3.5 percent, thus reaching 5.0 million barrels per day in 1995, from 2.5 million barrels per day in 1975.

Against the provincial and national energy forecasts, the NSRB economy can be discussed with respect to its productive capacity of energy and export market potential, and energy scenarios may be formulated for the years 1980 and 1985.

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[1]Economic Council of Canada, Options for Growth, Twelfth Annual Review, (Ottawa : 1975), pp. 129-31. For an estimate of a 4.0 percent growth rate in total Canadian energy demand to 1990, see National Energy Board, Energy Supply and Demand in Canada and Export Demand for Canadian Economy, 1966-1990, (Ottawa : 1969). As for the provincial energy outlook, particularly in respect to natural gas demand and supply, it is estimated by ERCB that during the 1978-1985 period, Alberta gas demand is expected to grow at 3.9 to 4.9 percent per year. For this point, see Energy Resources Conservation Board, The Supply of and Demand for Alberta Gas, (Calgary : 1978).

[2]Edmonton Journal, December 13, 1976.

The NSRB, embracing the conventional oil fields such as Pembina, Leduc-Woodbend, Redwater, Joarcam, Ferrier, Willesden-Green, and Lloydminster, accounted for almost 40 percent of provincial crude oil production in 1972. Since most of these oil fields will gradually be depleted, future production will not increase substantially over the 1972 level. The new oil projects, mostly heavy oil sand developments, that are expected to affect oil production in the region will be (1) the 4.5 billion dollar Cold Lake heavy oil project proposed by Imperial Oil Company, and (2) the Lloydminster heavy oil project of Husky Oil with capital costs of some $600 million.

The Cold Lake project will have a significant impact on the basin economy in terms of the scale of production proposed and the huge intake of water for steam injection and water flood recovery methods to be used for extracting bitumen. The project is scheduled to commence on-site construction in 1981 and to be completed in 1985. The productive capacity of the project, when in full operation, is estimated to be 150,000 to 160,000 barrels per day[1] of synthetic crude oil, which would increase the total basin's capacity by 30 percent over that of 1972.

In view of the potential developments in demand and supply of crude oil in the basin, it is reasonable to

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[1]Resource Management Consultant, Socio-Economic Overview of the Cold Lake Heavy Oil Project, (Edmonton:1978).

develop scenarios incorporating growth patterns in final demand of 1.0 percent, 1.5 percent and 2.0 percent--Low, Medium and High growth assumptions, respectively.

Regarding natural gas production, the provincial rate of growth had averaged 2.0 to 3.0 percent per year since the 1960's and has accelerated recently, especially with the emergence of a pricing policy that is based on a thermal energy content compared to that of crude oil. Although it is true that the conventional oil and gas reserves in the province will eventually be depleted in the course of time, it is unlikely that eventuality would occur in the time frame under consideration in this study. For example, as of 1976, the life index for conventional gas reserves in Alberta is known to be approximately 21 years, about 50 percent longer than that for conventional oil, thus implying natural gas would last 50 percent longer in time than oil. Discovery of gas reserves within the basin appears unlikely and any increase in gas production will likely be due to stepped-up operations of existing fields. The Economic Council of Canada predicts that national gas energy requirements are expected to increase by 8.5 percent per year over the 1975-1980 period, mainly because of the versatile uses of this form of energy, including use as feedstocks in large-scale petrochemical complexes, and also because natural gas is underpriced relative to crude oil in terms of thermal energy content. After 1980 the rate of growth will slow to between 3.5 percent and 5.0 percent per

year, depending on the pricing policy adopted by the government.

The NSRB's relative importance in supplying gas for both regional consumption and export demand is likely to level off, particularly in the long run, because new reserves of considerable size are reported outside the basin such as the Elmworth area near Grande Prairie, which has an estimated reserve of some 100 trillion cubic feet.

In consideration of the above factors relating to supply and demand for natural gas, a scenario will be developed assuming that the total final demand for natural gas will grow by 3.0 percent, 4.0 percent, and 5.0 percent (Low, Medium, and High) for 1972-1980 and 2.0, 3.0, and 4.0 percent for 1981-1985.

Electric Power

The rapid economic and population growth in Alberta has resulted in electric power generation more than doubling over the 1966 to 1976 period, from 6,149 gigawatt hour (GWH) to 15,779 GWH, equivalent to an annual real growth rate of more than 9.0 percent. This power demand has been met exclusively by thermal power developments, mainly because coal or natural gas, the major fuel inputs to power generation, have been readily available in the province at relatively moderate price.

In 1972, roughly 76 percent of the net generating capacity in Alberta was located in the NSRB, the major stations

being the large-scale thermal power plants operated by Calgary Power in the Wabamun Lake area and the gas-fired generating plants operated by Edmonton Power along the North Saskatchewan River.

Considering the trend in power demand since 1972, and subsequent planned investment schedules in power plant capacity within the basin until 1985 (Table 5-2), it

TABLE 5-2

LIST OF MAJOR POWER DEVELOPMENT PROJECTS

Project Name	Type	Time Frame	Capacity (megawatts)
Calgary Power			
Sundance Units # 4, 5, & 6	Thermal	1974-1980	510
Keephills plant	Thermal	1977-1984	750
Edmonton Power			
Clover Bar	Thermal	1973-1978	350
Genesee Plant	Thermal	1980-1985	750
Alberta Power			
Forestburg #5	Thermal	1977-1981	352
TOTAL			2,712

Source: Alberta Department of Business Development and Tourism, List of Industrial Projects, 1978 (Edmonton : 1978) and Energy Resources Conservation Board, Cumulative Annual Statistics, Electric Power Industry, (Calgary : 1976).

appears likely that net capacity in the basin will increase from 2,091 megawatts in 1972 to about 4,800 megawatts in 1985. The major power projects within the basin that have been completed since 1972, and the ones planned during the projection period, 1980-1985, are provided in Table 5-2. Two large-scale power projects will be coming on stream in the 1980's, i.e., (1) Keephills power plant by Calgary Power (two 375 megawatt units), and (2) Genesee Power Plant by Edmonton Power (two 375 megawatt units). These two plants will be coal-fired, and the coal will be supplied locally implying that sub-bituminous coal production will be increased substantially.

Assuming the capacity load factor does not change significantly, the expected increase in power generating capacity can be translated into a corresponding increase in power generation. It is thus expected that the demand for electric power will increase by about 7.5 percent per year over the 1972-1985 period. Based on the above, the final demand scenarios for electric power were formulated to range between 5.5 percent for Low, 7.5 percent for Medium, and 9.5 percent for High.

Chemical Products Sector

The chemical industry, encompassing such diverse products as inorganic chemicals, organic chemicals, petrochemicals and fertilizers, will continue to expand as one of the most pivotal manufacturing bases in the NSRB region

because of ready accessibility to abundant feedstocks, mainly natural gas, which is being produced in the basin, and also because of the provincial government's industrial policy of ensuring maximum processing of energy resources within Alberta.

The major large-scale petrochemical complexes in the region are concentrated in the Edmonton-Fort Saskatchewan area. These account for almost 70 percent of provincial production. The prospects for industrial expansion of petrochemical products are high, as indicated by the industrial composition of proposed investments. As of January 1, 1978, capital investment project proposals submitted by major industries in Alberta amounted to $18.5 billion, of which some $16 billion or 86.5 percent will be invested in the petroleum and petrochemical products sector. The specific proposals that will directly affect the capacity of the petrochemical sector are discussed in the following sections.

Dow Chemicals of Canada is planning to invest $400 to $500 million to expand plant facilities through upgrading and construction of new structures. The ultimate impact will be to substantially increase productive capacity, probably by some 30 to 50 percent. Petrochemical products directly affected by the project will include vinyl chloride monomer, ethylene dioxide, polyethylene, formaldehyde, etc. The major feedstocks for this production will be produced by Alberta Gas Ethylene Ltd., at the Joffre plant. Other significant investments in the region that are expected to come on stream in the 1980's are:

1. A $50 million project by Diamond Shamrock Alta. Gas Ltd. with a productive capacity of 200 million pounds of polyvinyl chloride per year;

2. A $5 to $10 million project by Sheritt-Gordon Mines Ltd. to install a new urea plant for increased fertilizer production;

3. A $250 million project initiated by Petrochemical Alta Ltd. with scheduled production of benzene, and

4. A Union Carbide Canada project with an air separation plant scheduled to be built in Fort Saskatchewan.

The expected capacity increase in petrochemical production is in line with the anticipated rapid increase in market demand for these products, which is projected to grow at 10 percent per year nationally until 1985.

Based on the foregoing expected developments in the petrochemical sector in the coming decade, and on the resource potential that the basin economy possesses, scenarios assuming a 3 percent, 5 percent and 7 percent rate of growth will be developed for the Low, Medium and High cases respectively.

Agricultural Sector

Alberta has traditionally been one of the major grain producing and exporting provinces in Canada. The agricultural sector in the basin is basically mixed farming, with wheat, barley, oats, and rapeseed the major grain outputs and livestock the major non-grain product. The

inherent economic problem facing agriculture in Canada is that agricultural prices received by farmers are usually determined exogenously by foreign market conditions while operating costs rise with the general inflationary trend. The projections of future agricultural prices expected and the export demand anticipated over the next decade are very difficult to make, because both price and demand for Alberta agricultural products, especially grains, will depend almost entirely on foreign supply and demand conditions. In view of this uncertainty regarding export prospects for agricultural products, and considering a projection for agrcultural exports by the Economic Council of Canada showing 3.8 percent to 4.4 percent annual growth in the 1975-1980 and 3.1 to 4.6 percent in the 1980-1985 period[1] (depending on assumptions concerning the strength of the external environment), the following growth pattern of export demand for the NSRB agricultural products is hypothesized (Table 5-3).

TABLE 5-3

ANNUAL GROWTH RATES OF FINAL DEMAND FOR AGRICULTURAL PRODUCTS, NSRB, 1972-85

	Low %	Medium %	High %
Grains	3.0	3.5	4.0
Other agri-cultural	1.0	2.0	3.0

Final Demand Scenarios

With the growth of key export sectors (accounting for almost 80 percent of the regional export total) determined as described above, the basic growth factors for all commodities in the final demand sector corresponding to three economic scenarios--Low, Medium and High--were developed. The underlying population growth assumptions were 1.0, 2.0 and 3.0 percent for the Low, Medium and High scenarios, respectively. Also taken into account were the overall national trends for the next decade for various final demand components (such as durables, non-durables, and residential construction) as forecasted by the Economic Council of Canada.[1]

The summary results of the three final demand scenarios, by major commodity group and for both 1980 and 1985 are presented in Table 5-4. The disaggregated final demand vectors for 1980 and 1985 are shown in Appendix D.

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[1]Economic Council of Canada, Twelfth Annual Review: Options for Growth, (Ottawa : 1975), particularly p. 152 and p. 148.

TABLE 5-4

FINAL DEMAND SCENARIOS, 1980 & 1985, NSRB[1]

(millions of 1972 dollars)

Major Commodity Group	1980 Low	1980 Med	1980 High	1985 Low	1985 Med	1985 High
Agriculture[2]	148	165	186	170	202	234
Mining[3]	673	708	745	716	779	837
Manufacturing	249	326	407	300	443	600
Construction	1,055	1,139	1,229	1,283	1,452	1,643
Transportation[4]	210	227	245	232	263	298
Utilities	137	168	182	176	237	279
Trade[5]	453	490	529	501	568	644
Finance[6]	151	164	177	167	190	215
Services	1,051	1,137	1,229	1,119	1,272	1,443
TOTAL	4,129	4,526	4,929	4,665	5,405	6,194

Notes: (1) Final demands for each sector are determined autonomously according to low, medium and high scenarios, including export demands that are measured on a net trade flow basis.
(2) Includes forestry, fishing, hunting and trapping.
(3) Includes oil and gas extraction.
(4) Includes storage and communication.
(5) Includes retail and wholesale trade.
(6) Includes insurance and real estate.

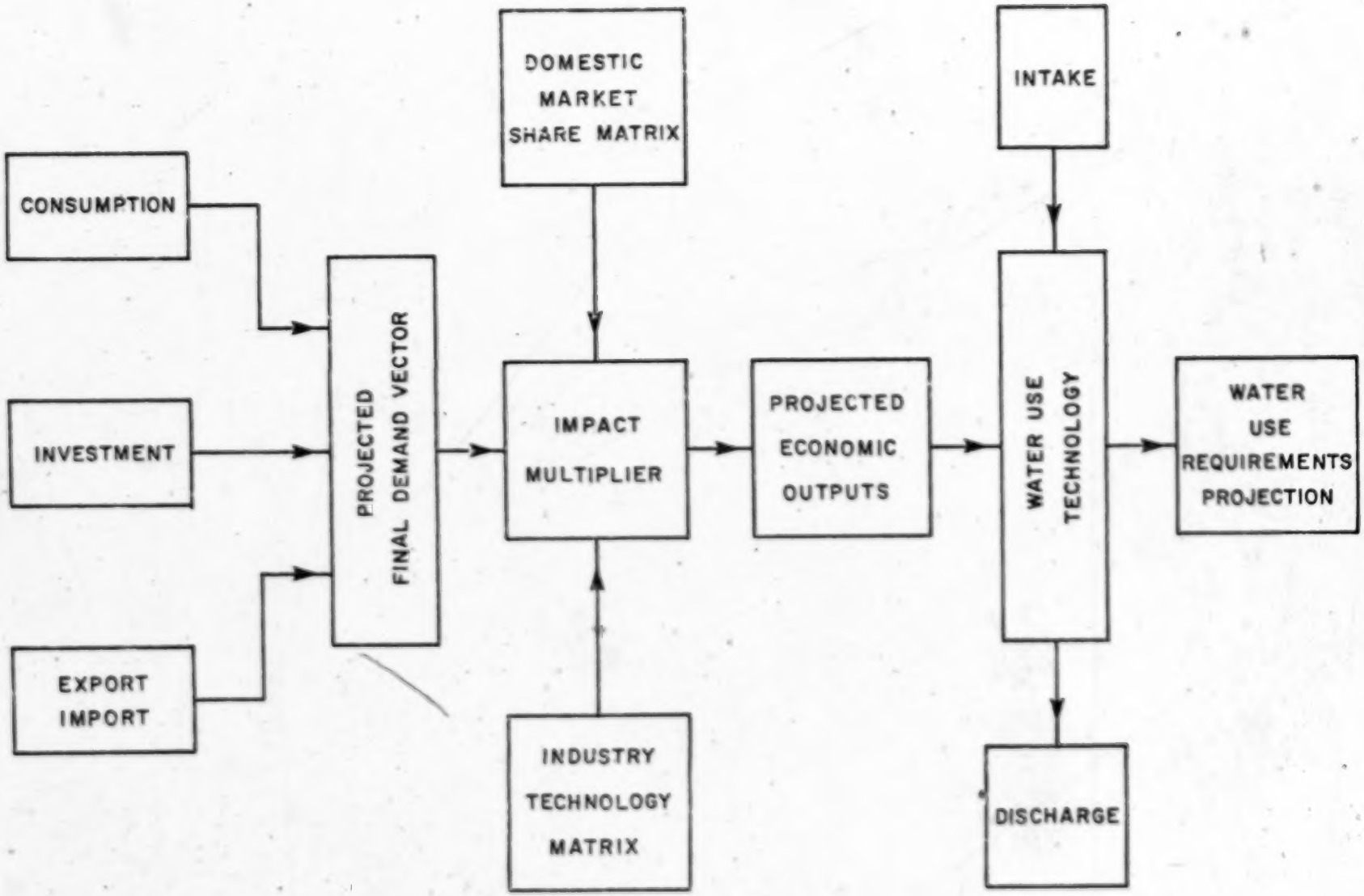
Output Projections for 1980 and 1985

The following chart (Figure 5-1) presents the schematic sequence or procedure used in estimating water use projections, commencing with a final demand scenario.

A final demand scenario is a set of hypothetical values of consumption, investment, government expenditures and net export by major commodity, that is likely to occur in the future. The level of output of each industry that will be consistent with this specified bill of final demand is identified, given certain market share and production technology assumptions. An inverse matrix or impact table translates the final demand scenario into a set of industry output requirements that must prevail if the final demand is to be satisfied. The projected level of each industry output thus obtained can be transformed into a volume of water required for production via a water technology matrix. Since water use by an industry involves either withdrawal or consumptive use, water use projections can be performed in two ways, using either total intake or consumptive amounts.

According to the model developed earlier, the basin economy, as measured by real gross output, is expected to grow at an annual rate ranging between a low of 3.0 percent and a high of 6.0 percent to 1985. The most likely scenario, Medium, indicates that the outputs of the basin economy will grow at an annual rate of 4.0 to 4.5 percent

FIGURE 5-1 SCHEMATIC FLOW CHART



over the projection period. The total value of gross industry outputs, measured in terms of 1972 dollars, is expected to reach $8,073 million in 1980 and $9,726 million in 1985, compared to $5,998 million in 1972, according to the Medium scenario. The Low and High scenarios showed a total of $7,342 and $8,353 million respectively for 1980 and $8,819 million and $11,109 million, respectively, for 1985.

Broken down by individual sectors, it can be seen that utilities (in particular, electric power), manufacturing and construction sectors will be among the leading sectors of the basin economy, all registering growth rates of 6.0 to 7.0 percent per year throughout the projection period. Service sectors in general will remain relatively weak in terms of rate of growth. As far as the basin is concerned, mining activities, including crude oil and natural gas, are projected to grow at a modest rate of 2.5 percent per year over the period, mainly because, although the external demand pressure on Alberta energy resources will likely remain strong, production from conventional oiland gas fields, which comprises most of the basin's energy resources, will decline or level off due to a gradual depletion of existing reserves. It is more likely that additional pressure on Alberta energy resources will be increasingly met by resource developments elsewhere in the province, such as Athabasca oil sands and Peace River Deep Basin Devlopment, although the Cold Lake project in the basin to be analyzed

later would undoubtedly supplement the declining production from conventional oil fields.

On the other hand, agriculture is likely to grow parallel with the pace of the overall basin economy throughout the projection period to 1985, assuming steady market developments both at home and abroad. Meanwhile, tertiary industries such as services, finance and insurance will experience growth below the overall level of the basin economy. The following table (Table 5-5) presents a summary of output projections for 1980 and 1985 by major industry group. Detailed output projections for all industies is given in Appendix D, Table D

TABLE 5-5

OUTPUT PROJECTIONS FOR 1980 & 1985, NSRB
(millions of 1972 dollars)

Industry	1980			1985		
	Low	Med	High	Low	Med	High
Agriculture	586	650	717	654	772	900
Mining	937	1,001	1,065	1,024	1,141	1,256
Manufacturing	1,518	1,738	1,968	1,793	2,209	2,667
Construction	1,180	1,275	1,376	1,421	1,611	1,823
Transportation	423	462	503	475	548	628
Utilities	232	273	296	284	363	425
Trade	633	689	748	711	814	929
Finance	502	543	585	556	631	712
Services	1,331	1,443	1,562	1,437	1,637	1,769
TOTAL	7,342	8,073	8,819	8,353	9,726	11,109

Economic activity is usually measured in terms of Gross Domestic Product (GDP) net of intermediate input transactions between industries. GDP consists of such factor payments as wages, salaries, rents, interest, taxes, etc. resulting from economic activities. The basin's GDP was projected as follows: given the projected output vectors for 1980 and 1985, as calculated above using the inverse matrix and final demand scenarios, a vector of the value added ratios for the base year 1972 was applied to these projected output vectors to compute the corresponding value added or GDP for each industry. GDP, expressed in terms of 1972 constant dollars, is expected to reach $5,079 million for the Low Case, $5,840 million for the Medium Case, and $6,645 million for the High Case in 1985, while the corresponding figures for 1980 would be $4,521 million, $4,931, and $5,343 million respectively. This is shown in Table 5-6. When measured in terms of average annual growth rates, GDP is expected to grow at rates between 3.0 to 6.0 percent[1]

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[1]It is noteworthy that the projections for 1975-1985 based on an econometric growth model by R. Wright and R. Mansell, An Analysis of Economic Development, Growth and Population Change in Alberta, 1975-1985, (Alberta Government, Unpublished Report, 1977), focusing upon inter-relationships between economic development and demographic variables (endogenous) showed average annual growth rates ranging between 3.2 and 5.8 percent depending on different scenarios postulated regarding the growth rates of exogenous sectors such as agriculture, manufacturing and mining (oil and gas). Although econometric models and input-output models are based on different methodologies and assumptions, it is interesting to note that Scenario (2) and (5) in the Wright-Mansell model which is considered to be as close to our final demand medium scenario, generated growth projections of 3.2 percent and 3.4

TABLE 5-6

GDP PROJECTIONS FOR 1980 & 1985, NSRB

(millions of 1972 dollars)

Industry	1980 Low	1980 Med	1980 High	1985 Low	1985 Med	1985 High
Agriculture	261	288	316	293	343	397
Mining	616	657	700	673	749	824
Manufacturing	471	547	627	563	708	867
Construction	500	540	583	606	687	777
Transportation	333	364	396	374	431	495
Utilities	170	200	217	208	267	312
Trade	423	460	500	475	544	622
Finance	404	437	471	447	507	573
Services	958	1,039	1,124	1,034	1,178	1,338
Public Admin.	385	398	409	406	425	440
GDP at market Prices	4,521	4,931	5,343	5,079	5,840	6,645

during the period.

The contribution of any sector to overall growth is often measured by a so-called sectoral contribution rate, defined as the sectoral growth rate weighted by the sector's relative size in the base year, and divided by the total GDP growth rate. This rate reflects not only the absolute rate of sectoral growth but also the sector's relative weight in the base year, thus becoming a combined indicator of the sector's contribution to overall growth. According to the Medium Scenario, the sectors with highest contribution to growth are: (1) manufacturing with 16.7 percent and 17.2 percent for 1980 and 1985 respectively; (2) services with 16.2 percent and 15.8 percent; (3) construction with 14.9 percent and 15.5 percent; and (4) the mining sector with 11.1 percent and 10.7 percent. This is shown in Table 5-7. Sectors with the least contribution were public administration with 3.5 percent and 3.2 percent for 1980 and 1985, respectively, and agriculture, 6.1 percent and 6.0 percent. This means that, of the total growth rate of 54.7 percent in the basin's GDP over the period, 1972-1985, roughly 17.2 percent was accounted for by the manufacturing sector, 15.5 percent by construction, 15.8 percent by the service sector, 6.0 percent

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(cont'd) percent per year over the forecast period of 1975-1985, which is very close to our projections of 3.5 to 3.7 percent obtained from the input-output model.

TABLE 5-7

SECTORAL CONTRIBUTIONS

TO OVERALL GROWTH

Industry	1980		1985	
	Composition(%)	Contribution(%)	Composition(%)	Contribution(%)
Agriculture	5.8	6.1	5.9	6.1
Mining	13.3	11.1	12.8	10.7
Manufacutring	11.1	16.7	12.1	17.2
Construction	11.0	14.9	11.8	15.5
Transportation	7.4	7.5	7.4	7.5
Utilities	4.1	6.6	4.6	6.9
Trade	9.3	9.4	9.3	9.3
Finance	8.9	8.1	8.7	8.0
Services	21.1	16.2	20.2	15.8
Public Admin.	8.1	3.5	7.3	3.2
GDP at market Prices	100.0	100.0	100.0	100.0

Note: This is based on the Medium Scenario only, and the reference year for which comparison was made is 1972. The industrial groupings followed the same as in Table 5-4.

by agriculture, 3.2 percent by the public sector, and so on. The low contribution by the agriculture and public sectors stems not only from their relatively slow growth rates but also from their low weights in terms of GDP in the base year. This is illustrated by the service sector where, in spite of its slow growth relative to the overall economy, its sheer size, about 22.6 percent of GDP in 1972, caused its contribution rate (15.8 percent) to rank second in 1985. An important aspect of growth trends is that one can identify which sectors will lead the region's growth in a dynamic sense. For instance, with a high growth rate of 6.5 percent per year throughout the projection period and an increase in contribution from 6.6 percent to 6.9 percent from 1980 to 1985, the utilities sector will continue to increase its GDP composition from 3.3 percent in 1972 to 4.6 percent in 1985. Similarly, manufacturing will increase from 9.4 percent in 1972 to 12.1 percent in 1985, and service and public sectors will decrease their composition from 22.6 percent and 9.5 percent in 1972 to 20.2 percent and 7.3 percent in 1985, with a lower contribution rate in 1985 than in 1980.

Projected Water Demands, 1980 & 1985

The demand for water in the basin consists of two components: (1) industrial water demands covering all economic activities that will be endogenously determined within the model given a scenario of final demands, and

(2) domestic household use that will be exogenously determined outside the system depending upon population growth assumptions and per-capita water use coefficients.

Industrial water use is directly related to the level of economic activity in all industries in the basin, technological linkages existing within the economic system, water use technology, and ultimately, the pattern of final demands. Industrial water demand projections are internally generated, given a specified bill of final demands via a set of parameters such as production technology and water use technology. This level of projected water demands must be satisfied in order to support the specified level of final demands.

In addition to these internally determined industrial water demands, there exists another category for water use demands related to domestic household needs, such as drinking water, sanitary, lawn watering etc. that is usually reflected in the I-O system as one component of the final demand vector designated as an exogenous sector. Since this cannot be generated within the I-O system, it has to be estimated separately. Domestic household usage of water is likely to depend on, among other things, the size of the population and the standard of living. A summary table showing the level of water demands anticipated within the basin for 1980 and 1985, including domestic uses, is presented as follows (Table 5-8).

From a water resource demand point of view, it

can be seen that total water withdrawal demands including domestic uses are expected to grow at a rate slightly higher than the regional GDP over the period, 1972-1985. According to the Medium Scenario, the regional economy, as measured by GDP, is projected to grow at approximately 4.0 percent per year whereas total water withdrawal uses are expected to increase at roughly 4.7 percent per year during the same period. This means that, apart from price elasticity considerations, which are of no concern in this case because the relative price structure between water and other products is assumed to be fixed by the use of 1972 base year prices, the growth elasticity of water withdrawal uses would be in the order of 1.20. That is, if the GDP of the region increases by one percent, the correspoding rate of increase in demand for water, including all industrial and domestic uses, would be 1.2 percent. Because water-intensive economic activities such as the petrochemical, chemical, oil refining, and mining industries are expected to gain momentum relative to other sectors of the economy, the proportion of industrial water withdrawal uses to total water withdrawal in the basin will increase from 66 percent to almost 70 percent in 1985. Conversely, domestic household uses are likely to increase less rapidly than overall use, thus decreasing in importance from 34 to about 30 percent of total use. In the following sections, the analysis of detailed sectoral projections of water demands for 1980 and 1985 corresponding to the three scenarios will be presented.

TABLE 5-8

TOTAL WATER DEMANDS, NSRB[1]

(million imperial gallons)

	1972	1980	1985
Industrial[2]	26,211	36,583	44,932
Domestic[3]	13,569	16,858	19,307
TOTAL	39,780	53,441	64,239

Notes: (1) Projections for 1980 and 1985 are based on the Medium Scenario. (2) Agriculture and commercial uses are also included. (3) Domestic uses are projected based on a 2 percent per year population growth (Medium Scenario) and an income elasticity of per-capita water use of 0.53 throughout the projection period.

Industrial Water Withdrawal Demands

Given the level of output projections for each industry, as generated from the regional input-output model compatible with the stipulated final demand scenario, water withdrawal uses required by each industry to support these levels of regional economic activities can be estimated by superimposing a water technology matrix on each output. Specifically, given a projected output vector, g_1 (generated by post-multiplying the inverse matrix, $R = [\ I - DB\ ]^{-1}D$

by a specified final demand vector, f_1), the projected water demands by industry for 1980 and 1985 can be generated by pre-multiplying the above matrix, R by a diagonal water matrix, [w_{ii}], with respective water intake coefficients w_{ii} arranged as diagonal elements. In algebraic terms, the projected water demand vector is equal to $W [I - DB]^{-1} Df_1$, or, more simply $W*R*f_1$. Projected levels of water withdrawal by major industry group are presented in Table D-2, Appendix D and are summarized in Table 5-9.

TABLE 5-9

WATER WITHDRAWAL USES BY MAJOR INDUSTRY GROUP, NSRB BASIN, 1980 & 1985

(million imperial gallons)

Industry	1980			1985		
	Low	Med	High	Low	Med	High
Agriculture	3,678	4,316	4,976	3,949	5,120	6,371
Mining	13,597	14,610	15,662	14,965	16,839	18,718
Manufact.	13,737	15,851	18,096	16,629	20,758	25,419
Construct.	77	84	90	94	106	119
Transport.	157	171	185	174	200	228
Utilities	374	450	488	469	616	724
Services	1,012	1,100	1,195	1,125	1,290	1,471
TOTAL	32,630	36,583	40,695	37,409	44,932	53,053

Source: As estimated from model simulations based on the 1972 regional input-output table, NSRB.

Among the sectors of rapid growth in water withdrawal over the 1972-1985 period will be utilities (+133.3 percent), manufacturing (+106.4 percent), and construction (+86.0 percent). Mining (+45.5 percent), services (+50.7 percent), and agriculture (+56.4 percent) will experience a moderate rate of growth in water requirements.

Primary metal, metal fabrication, power generation and chemical industries will be the highest-growth water users, with rates of increase of 132 percent, 89 percent, 72 percent and 68 percent, respectively, over the 1972-1980 period, and 246 percent, 166 percent, 135 percent and 128 percent over the 1972 to 1985 period. Moderately increasing sectors in 1985 as compared to usages in 1972 will be petroleum refining (+66 percent), livestock (+57 percent) and oil and gas extraction (+37 percent).

Because of differing rates of growth in water requirements among various sectors of the economy, the composition of water withdrawal by major sectors will be shifted toward manufacturing, which will account for almost 46 percent of the industrial water withdrawal, up from 42 percent in 1972. The mining sector, with declining conventional reserves, will decrease its share of water use from 41.7 percent to 37.5 percent. Mining and manufacturing combined account for almost 84 percent of the industrial water uses within the basin, thus overshadowing other industrial uses.

Water withdrawal in the basin for all industrial

purposes will rise from 26,211 million imperial gallons in 1972 to 44,932 million imperial gallons in 1985, some 71.4 percent increase according to the Medium Scenario. The Low and High Scenarios result in water requirements of 37,409 million imperial gallons (+42.7 percent) and 53,053 million imperial gallons (+102 percent) respectively.

Consumptive Water Demand

Water withdrawn for either productive or domestic purposes is one measure of factor resource demands placed on the supply. However, a portion of the water withdrawn is returned to the system, augmenting the flows available to downstream users. Consumptive use is defined as the difference between intake or withdrawal and discharge. It results from loss of water in processing, evaporation, or the portion embodied in the manufactured product, etc. Therefore, from a net balance perspective, consumptive use is an appropriate concept for management of water resources within the basin. It is the ultimate measure of the factor resources required for production purposes. It also indicates a net removal of water from the supply sources that is not available for further uses. Furthermore, if the spatial distribution of intake points and discharge points is evenly spread along the stream, and if the quality of water discharged is controlled to meet minimum standards, then consumptive use is the best indicator of resource requirements.

The basin's projected water consumption was estimated by pre-multiplying a diagonal matrix consisting of water consumption coefficients for 1972 by the projected output vector. According to the Medium Scenario, total water consumption in the basin will increase from 18,809 million imperial gallons in 1972 to 24,736 million imperial gallons in 1980 and to 29,317 millions in 1985 representing an increase of 34.3 percent and 61.5 percent respectively over the base year 1972 (Table 5-10).

TABLE 5-10

CONSUMPTIVE WATER DEMANDS, NSRB, 1980 & 1985[1]

(million imperial gallons)

	1972	1980	1985
Industrial[2]	16,095	21,364	25,456
Domestic[3]	2,714	3,372	3,861
TOTAL	18,809	24,736	29,317

Notes: (1) The figures for 1980 and 1985 are projected based on the Medium Scenario. (2) Agriculture is included. (3) Consumptive uses for domestic and municipal purposes are estimated using 20 percent of the total withdrawal.

Source: As calculated from model simulations based on the 1972 regional input-output table, NSRB.

This projected rate of increase in consumptive water demands is somewhat lower than that of water withdrawal demands, indicating that for the basin as a whole, the proportion of water discharged into the water system will become somewhat higher through a shift in the economic structure towards less water consumptive economic activities.

Of the two major water use categories, industrial and domestic, the former will likely outstrip the latter in terms of rate of growth. The present model forecasts industrial consumptive use to reach some 21,364 million imperial gallons in 1980 and 25,456 million in 1985, representing a 32.7 percent and 58.2 percent increase, respectively, when compared with 1972. Meanwhile, domestic consumptive use of water will increase by only 24.2 percent and 42.2 percent in 1980 and 1985 as compared to the 1972 level. In estimating the portion of water intake not returned to the river system in relation to domestic uses, a water consumption ratio of 20 percent relating total amount of water consumed (withdrawal minus discharge) to total amount of water withdrawn was assumed to hold for domestic and municipal uses. In view of the scarcity of data regarding the precise ratio of consumptive use to total water withdrawal, particularly in relation to domestic use, the Canadian average of 20 percent[1] was used in the

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[1] Environment Canada, Canada Water Yearbook, 1975, (Ottawa : 1976), p. 105.

calculations of the above domestic consumptive water usages for the basin for the year 1972.

Among the major sectors whose water consumption is likely to grow most rapidly in the period, 1972-1985, are utilities (+135 percent), manufacturing (+116 percent), construction (+73 percent). These are followed by relatively moderate growth sectors such as agriculture (+56 percent) and mining (+37 percent). The range of industrial water consumption corresponding to the Low and High growth scenarios varied between 21,544 million (+34 percent) and 29,556 million imperial gallons (+84 percent) over the period, 1972-1985 (Table 5-11).

TABLE 5-11

CONSUMPTIVE WATER USES BY MAJOR INDUSTRY GROUP NSRB, 1980 and 1985
(million imperial gallons)

Industry Group	1980 Low	1980 Med	1980 High	1985 Low	1985 Med	1985 High
Agriculture	3,677	4,315	4,975	3,948	5,118	6,368
Mining	10,624	11,245	11,890	11,499	12,631	13,735
Manufacturing	4,513	5,259	6,052	5,531	6,981	8,605
Construction	14	15	16	17	19	23
Transportation	4	4	4	4	4	5
Utilities	366	441	478	459	605	711
Services	77	85	91	86	97	112
TOTAL	19,275	21,364	23,506	21,544	25,456	29,556

Domestic Water Withdrawal Demands

This water demand varies with population, frontage of lot, size of lawn, degree of urbanization, etc., rather than directly with economic activity. Of course, regional economic activities could have indirect effects on this type of water usage through impacts on population size, but this effect will be measured directly.

Domestic water demands are measured by breaking the population into those living in urban cities, towns, villages or rural areas for the base year 1972. Each population group is associated with the respective per-capita per day usage data as obtained from municipal water supply statistics. Price elasticities are not considered here because the relative price structure of the economy, including water charges, is frozen at the base year of 1972, and this fixed structure is projected to 1980 and 1985, all measured in terms of constant 1972 dollars. The resulting projection of water demands should be interpreted to indicate the level of domestic water demands that will be attained if the relative price structure of 1985 were to remain the same as that of 1972.

The population breakdown by cities, towns, villages and rural areas and the respective per-capita per day water usages applied for each category, as well as the subsequent amount of water withdrawn for domestic purposes for the year 1972, are summarized in Table 5-12.

TABLE 5-12

DOMESTIC WATER WITHDRAWAL USES, NSRB, 1972

	Per-capita per-day use (gallons)	Population	Quantity of Water (MMIG)
Urban Cities	60	463,417	10,149
Towns	40	109,101	1,593
Villages	40	17,874	261
Rural	30	143,042	1,566
TOTAL		733,434	13,569

Sources: Per-capita per day uses are estimated by the author using various sources, mainly Canada Water Yearbook, 1975, by Environment Canada and " An Example of Excess Urban Water Consumption," in Canadian Journal of Civil Engineering, 1977 by M. Gysi and G. Lamb; the population figures come from Municipal Statistics, 1972, by Alberta Department of Municipal Affairs, and Statistics Canada's 1971 Population Census.

Because 65 to 70 percent of the basin population is concentrated in the Edmonton Metro Area, the per-capita water usage data and associated trend analysis for the Edmonton area will serve as a reference point for determining the magnitude of domestic household water withdrawal uses within the basin.

Based on the residential water usage data for the Edmonton area (Table 5-13) for the period, 1972-1975 and the real per-capita income figures for the same area

TABLE 5-13

RESIDENTIAL WATER CONSUMPTION

EDMONTON, 1972-1975

(million imperial gallons)

	1972	1973	1974	1975
Consumption	5363.4	5452.1	5610.7	6049.7
No. of Customers	87,536	89,494	92,326	93,227
Annual per customer (gallons)	61,271	60,921	60,771	64,892
Monthly per Customer (gallons)	5,106	5,077	5,064	5,407
Daily per Customer (gallons)	168	167	166	178

Source: M. Gysi and G. Lamb, "An Example of Excess Urban Water Consumption," Canadian Journal of Civil Engineering, Vol. 4, 1977.

(the Edmonton Statistical Yearbook), the average per-capita income elasticity of domestic water consumption for the City of Edmonton was calculated.

In estimating the urban domestic usage of water for the year 1972, the average per-capita domestic water use for the City of Edmonton was based on the total withdrawal of fresh water by the City for residential purposes. This amounted to 5,363.4 million imperial gallons,

or 168 gallons per day[1] for the 87,536 residential customers. Since the average number of persons per family from the 1971 population census was 3.3 for the City of Edmonton, daily water consumption was estimated to be about 51 gallons per capita. In addition to this, the amount of municipal water consumed for public purposes such as public park irrigation, firefighting, street cleaning, etc., as well as delivery loss of the system, was estimated to be approximately nine gallons per capita per day based on the figure of 1,288 million imperial gallons consumed from the municipal water system as "the unaccounted flows". Thus, the total domestic and municipal water usage in 1972 for urban centres in the basin area was estimated at 60 gallons per capita per day.

In projecting domestic water usage to 1980 and 1985, the impacts of two demand shifters--population growth and income growth--were considered. The rate of population growth for the NSRB basin was assumed to be two percent per year during the projection period.

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[1] M. Gysi and G. Lamb, "An Example of Excess Urban Water Consumption," Canadian Journal of Civil Engineering, Vol. 4, 1977, pp. 66-71. It should be noted that Gysi and Lamb also found a significant difference in per capita usage between Calgary and Edmonton, about 168 gallons and 330 gallons for Edmonton and Calgary respectively, which they attributed to the fact that Edmonton is 100 percent metered, while Calgary is only 18 percent metered.

The rate of growth of real income per capita in the NSRB was assumed to be 1.6 percent per year. The income elasticity of demand for water was assumed to be 0.54.[1] Using these assumptions, the increase in municipal water use would be 2 percent due to population impact and 0.9 percent (0.54 x 1.6) due to income impact, or a combined impact of 2.9 percent per year.

The usage rate for 1972 in towns, villages and rural areas varied between 30 and 40 gallons per capita per day, considerably lower than the urban counterpart.

> The rural domestic use per capita ranges between 30 and 40 gallons daily, with an average of 34.4 gallons. The prairie provinces are the lowest per capita users, but the variation between low and high is not great.[2]

Hence, a figure of 30 gallons per capita per day was used for rural consumption and 40 gallons per capita for towns and villages in the NSRB.

In summary, the total amount of water withdrawn for domestic purposes in 1972 was estimated to be 13,569 million imperial gallons, of which almost 75 percent is

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[1]This magnitude of the income elasticity of demand for municipal water is generally in line with estimates outlined in the survey article on studies of municipal water demand by S. T. Wong, "A Model On Municipal Water Demand," Land Economics, 48 February 1972, p. 42.

[2]Environment Canada, Canada Water Yearbook, 1975. (Ottawa : 1976).

accounted for by urban residents, 12 percent by town residents, and 13 percent by both villages and rural area residents.

Projected Water Demands In Relation To Water Supply

This section assesses the future demand-supply relationship of water resources in the NSRB by comparing projected water demands with long-term average streamflows. This will indicate potential water imbalances.

As a typical prairie river drawing on snow and ice formations as a major source of its water, the North Saskatchewan River exhibits an extremely wide seasonal variation in flow during the year. Sixty five years of data, 1911-1976, show that the flow rate in the river has fluctuated between a low of 1,620 cubic feet per second (hereafter cfs) in February and a high of 19,500 cfs in June, a range of 1:12. The typical monthly flow pattern of the river system, as recorded at the Edmonton Hydrometric Station is shown in Table 5-14. Although the simple arithmetic mean is 7,650 cfs, the flow rate in the winter month (November to March) drops to 1,700 to 2,600 cfs or 20 to 30 percent of the average. On the other hand,

TABLE 5-14

MONTHLY FLOW PATTERN, NSRB, 1911-1976

Month	Flow Rate (cfs)	Variation Index (Aver.=100)
January	1,670	21.8
February	1,620	21.2
March	1,760	23.1
April	5,500	71.9
May	10,200	133.3
June	19,500	254.9
July	19,400	253.6
August	14,200	185.6
September	8,710	113.9
October	4,810	62.9
November	2,620	34.3
December	1,790	23.4
Average	7,650	100.0

Source: Environment Canada, Historical Streamflow Summary, Alberta to 1976, (Ottawa : 1977) and as recorded at Edmonton.

in June and July it rises to peak at 19,500 cfs or 2.5 times the average. The significance of this variation in streamflows to the analysis of demand-supply condition is that potential imbalance, if it were to occur, would most likely emerge in the month of lowest flows, i.e., February. Conversely, if water imbalances in February can be overcome, there probably will be no water shortages throughout the rest of the year. Therefore, from a water resource planning point of view, it is the lowest monthly flow that is important as a measure of water supply, and not the average flow. The relationship between flow rate and time duration is indicated by a frequency-discharge curve. It shows the percentage of time a given rate of flow can be expected to be equalled or exceeded. Using data from Table 5-14 above, the frequency discharge curve for the North Saskatchewan River is plotted in Figure 5-2. A flow rate equal to or exceeding 1,650 cfs can be expected in the river 95 percent of the time. Taking a conservative approach, a flow rate of 1,650 cfs could be considered as the supply level of natural flows against which the projected level of total demands should be compared. This would constitute a criterion for understanding the problem of shortages or surplus in the basin, provided the demand pattern is reasonably uniform throughout the year.

The North Saskatchewan River is an inter-provincial stream and therefore an institutional constraint known as the "Interprovincial Apportionment Agreement" is binding

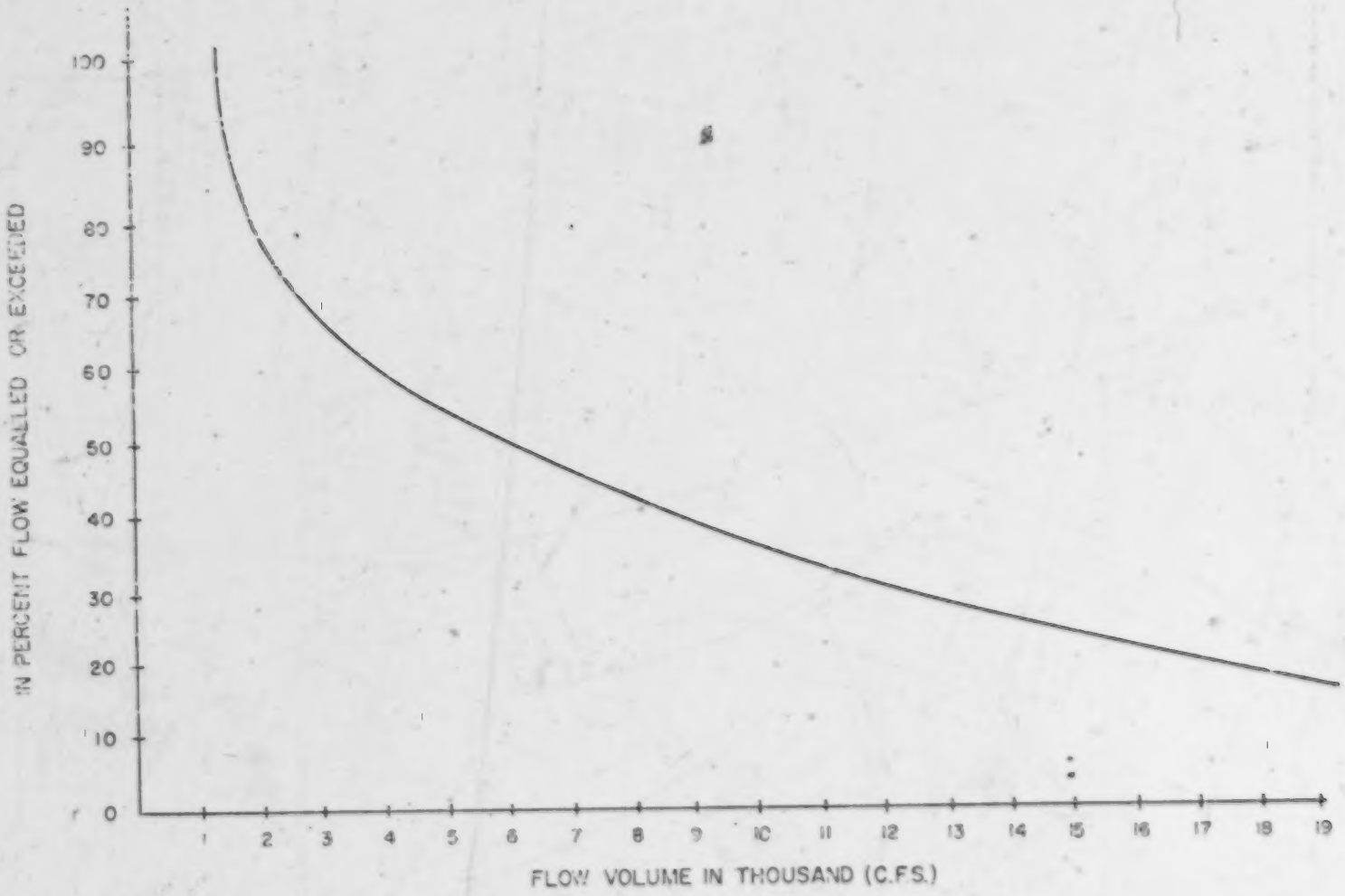

FIGURE 5-2 FREQUENCY DISCHARGE CURVE, NORTH SASKATCHEWAN RIVER

upon the province of Alberta. The Master Agreement signed between the provinces of Alberta and Saskatchewan in 1969 regarding the allocation of water resources crossing the boundary specifically states that in Schedule A, Paragraph 3 that:

> Alberta shall permit a quantity of water equal to one-half the natural flow of each watercourse to flow into the province of Saskatchewan, and the actual flow shall be adjusted from time to time on an equitable basis during each calendar year, but this shall not restrict or prohibit Alberta from diverting or consuming any quantity of water from any watercourse provided that Alberta diverts water to which it is entitled of comparable quality from other streams or rivers into such watercourse to meet its commitments to Saskatchewan with respect to each watercourse.[1]

The purpose of this agreement is to ensure minimum flows in the river to downstream provinces, and it becomes an additional demand or flow requirement to be met.

The flow rates required to meet the projected demands in the basin, based upon the Medium Scenario, must increase from 202 cfs[2] in the base year 1972 to 272 cfs and 327 cfs in 1980 and 1985 respectively (Table 5-15).

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[1]Government of Alberta, "Master Agreement," Schedule A, Paragraph 3, Alberta Official Gazette, Vol. 65, Part 2, (O. C. 2053/69), pp. 2488-95.

[2]One cubic feet per second (cfs) per year equals approximately 195 million imperial gallons.

TABLE 5-15

FLOW REQUIREMENTS OF PROJECTED WATER WITHDRAWALS, NSRB, 1980 & 1985[3]

(cubic feet per second)

	1972	1980	1985
Industrial[1]	133.5	186.3	228.8
Domestic[2]	69.1	85.8	98.3
TOTAL	202.6	272.1	327.1

Notes: (1) Agriculture and commercial uses are also included. (2) Domestic uses are projected based on a two percent per year population growth (Medium Scenario) and an income elasticity of per-capita water use of 0.53. (3) Projections for 1980 and 1985 are based on the Medium Scenario.

Source : As estimated from input-output water demand projection model, NSRB, 1972 using medium scenarios for 1980 and 1985.

Broken down by major sector, the flow requirement of the industrial sector will reach 186 cfs and 229 cfs in 1980 and 1985 respectively. On the other hand, a flow rate of 86 cfs and 98 cfs will be required in order to meet the projected demands for domestic and municipal uses.

In examining the water balance in the basin, the interprovincial apportionment requirement must first be accounted for by designating 50 percent of the natural flows for interprovincial requirements, and second, the

rate of streamflow available 95 percent of the time will be chosen as a measure of supply level. Accordingly, the apportionment requirement of 825 cfs is to be applied to the natural flow of 1,650 cfs.

The forecasted flow requirements (net of apportionment requirement) account for roughly 32.5 percent and 39.6 percent of the supply in 1980 and 1985 respectively. In other words, if the forecasted water withdrawals in 1980 and 1985 within the basin were to be met solely from the surface source, they would amount to 32.5 and 39.6 percent of the minimum flows respectively. These forecasts are based on the following conservative assumptions: (1) inter-provincial requirements are fully accounted for, (2) the seasonal pattern of water demand is assumed to be uniform, (3) the amount of water discharged back into the stream is not considered, (4) the supply level that is available 95 percent of the time is taken as a supply criterion for the year, and (5) all withdrawals are treated as if they were from surface flows.

Two important assumptions upon which the above conservative forecasts are based will be relaxed in order to provide a more realistic assessment of water imbalance possibilities. These two assumptions involve (1) the seasonal pattern of water demands, and (2) net withdrawals or consumptive water demands as a measure of resource demand.

In order to estimate the temporal distribution of water withdrawal demands, three major user categories were identified, to which a distinct seasonal pattern was

assigned. The major sectors considered to be influencing the overall demand pattern were (1) domestic, (2) industrial, mostly manufacturing, and (3) the mineral sector. Due to the lack of data, the manufacturing sector was defined to include all industrial sectors except the mineral sector. For each major use category, the temporal distribution of water usage was approximated using a seasonal pattern of production or monthly water consumption pattern. Residential water consumption data by month for 1975 and 1976 in Edmonton were taken as a proxy for deriving a seasonal pattern of water demands for the domestic sector. The seasonal variation in manufacturing activities was estimated from provincial data on the monthly value of shipments in all manufacturing industries, 1977. Finally, the seasonal fluctuation in water uses by the mineral sector was derived from the monthly amount of water injected for the production of oil and gas in the province for the year 1971. The seasonal variation indices, as calculated for categories of water uses, are presented in Table 5-16.

From Table 5-16, it can be seen that domestic water use has the largest seasonal variation (standard deviation=19.7). This probably reflects a peak demand in summer months due to lawn and garden watering. In contrast, the mining and manufacturing sectors have a more or less uniform pattern of water use over the seasons with smaller values of standard deviation (5.50 and 8.95). If, for each use category, the seasonal pattern of water demand is

Table 5-16

SEASONAL VARIATION INDICES OF

MAJOR WATER USING SECTORS

Month	Domestic	Mining	Manufacturing
January	83.5	102.9	83.0
February	81.5	93.7	87.1
March	77.0	103.6	95.0
April	78.7	98.4	90.9
May	98.8	95.5	99.8
June	119.7	90.3	106.8
July	131.6	97.3	104.0
August	132.9	97.2	109.8
September	117.7	100.4	110.0
October	101.9	104.5	111.3
November	90.6	105.0	103.4
December	86.0	111.2	98.9
AVERAGE	100.0	100.0	100.0

Sources: (1) Summary of Monthly Statistics, Alberta Oil & Gas Industry, ERCB, 1971. (2) Alberta Statistical Review, Alberta Bureau of Statistics, 1978. (3) Edmonton Water and Sanitation Department Files.

superimposed on the forecasted annual demands, and then the resultant time pattern is related to the monthly flows of the stream (net of inter-provincial apportionment requirement), the temporal distribution pattern of flow demands for the river basin as a whole will be apparent as shown in Tables 5-17, 5-18 and 5-19.

TABLE 5-17

MONTHLY FLOW BALANCE, NSRB, 1972

(cubic feet per second)

Month	Supply (1)	Domestic	Mining	Manufact.	Demand (2)	Ratio(%) (2)/(1)
Jan	835.0	58.6	61.6	62.9	183.1	21.9
Feb	810.0	57.3	56.1	66.0	179.4	22.1
Mar	880.0	54.1	62.1	72.0	188.2	21.4
Apr	2,750.0	55.3	58.9	68.9	183.1	6.7
May	5,100.0	69.4	57.2	75.6	202.2	4.0
Jun	9,750.0	84.1	54.1	80.9	219.1	2.2
Jul	9,700.0	92.4	58.1	78.8	229.5	2.4
Aug	7,100.0	93.4	58.2	83.2	234.8	3.3
Sep	4,355.0	82.7	60.1	83.3	226.1	5.2
Oct	2,405.0	71.6	62.6	84.3	218.5	9.1
Nov	1,310.0	63.6	62.9	78.3	204.8	15.6
Dec	895.0	60.4	66.6	74.9	201.9	22.6

Note: Flow supplies by month were calculated by taking 50 percent of the monthly natural flows as historically observed over sixty five years, 1911-1976 (because of interprovincial apportionment requirements). Manufacturing is defined to include all industrial sectors except mining. About 16.1 million imperial gallons are converted into one cfs per month.

Source: Environment Canada, Historical Streamflow Summary, Alberta to 1976 and as estimated from the input-output water demand projection model, NSRB, 1972.

TABLE 5-18

MONTHLY FLOW BALANCE, NSRB, 1980

(MEDIUM SCENARIO)

(cubic feet per second)

Month	Supply (1)	Domestic	Mining	Manufact	Demand (2)	Ratio(%) (2)/(1)
Jan	835.0	72.9	77.8	94.4	245.1	29.4
Feb	810.0	71.1	70.8	99.1	241.0	29.8
Mar	880.0	67.2	78.4	108.1	253.7	28.8
Apr	2,750.0	68.7	74.4	103.4	246.5	9.0
May	5,100.0	86.2	72.2	113.5	271.9	5.3
Jun	9,750.0	104.5	68.3	121.5	294.3	3.0
Jul	9,700.0	114.8	73.6	118.2	306.6	3.2
Aug	7,100.0	116.0	73.5	124.9	314.4	4.4
Sep	4,355.0	102.7	75.9	125.1	326.1	7.5
Oct	2,405.0	88.9	79.0	126.6	294.5	12.2
Nov	1,310.0	79.1	79.4	117.6	276.1	21.1
Dec	895.0	75.0	84.1	112.5	271.6	30.3

Note: Flow demands based on the Medium Scenario forecasts.

TABLE 5-19

MONTHLY FLOW BALANCE, NSRB, 1985

(Medium Scenario)

(cubic feet per second)

Month	Supply (1)	Domestic	Mining	Manufact	Demand (2)	Ratio(%) (2)/(1)
Jan	835.0	83.4	89.7	120.6	293.7	35.2
Feb	810.0	81.4	81.6	126.7	289.7	35.8
Mar	880.0	77.0	90.3	138.2	305.5	34.7
Apr	2,750.0	78.6	85.8	132.2	296.6	10.8
May	5,100.0	98.8	83.3	145.1	327.2	6.4
Jun	9,750.0	119.6	78.7	155.3	353.6	3.6
Jul	9,700.0	131.5	84.8	151.2	367.5	3.8
Aug	7,100.0	132.8	84.7	159.7	377.2	5.3
Sep	4,355.0	117.6	87.5	159.9	365.0	8.4
Oct	2,405.0	101.8	91.1	161.9	354.8	14.8
Nov	1,310.0	90.6	91.5	150.3	332.4	25.4
Dec	895.0	86.0	96.9	143.8	326.7	36.5

Note: Flow demands based on the Medium Scenario forecasts.

This information helps to show what effects the seasonal pattern of demand has on the assessment of water imbalance for the basin.

With the seasonal pattern of water demands explicitly taken into account, the monthly flow balance is established by simply relating flow demand to flow supply in each month. The results show that the percentage of monthly flow demand to monthly flow supply, calculated as a measure of demand pressure on the existing supply, varies widely among the seasons. For example, in the case of the "Medium Scenario" for 1985, it varies from a low of 3.6 percent in the month of June to a high of 36.5 percent in the month of December. This means that demand pressure on flow supply changes significantly over the months; in particular, December has the least excess water, with the demand level reaching 36.5 percent of the supply.

Although February is the month of minimum streamflows, December is more likely to be the critical month in terms of potential water imbalance. The flow balance is seen to be consistently tighter in December than for any other month when the seasonal pattern of water use is also considered.

It is anticipated that in 1980 and 1985 (Medium Scenario), total flow demands associated with consumptive water demands, including the domestic sector, will approach 127 cfs and 150 cfs respectively, representing an increase of 32 and 56 percent over the 1972 level of 96 cfs. When compared to the minimum monthly streamflow of 810 cfs

(net of apportionment requirement), these consumptive flow demands would constitute 15.7 and 18.7 percent of the minimum flow supply. It is apparent that these consumptive flow demands are considerably lower than the corresponding withdrawal demands as forecasted for 1980 and 1985--in fact, almost one-half the quantity of water intake.

Although it is hazardous to extend projections into the far future, an estimate of water balance, utilizing the present model and based on the 1972-1985 projections, indicates that it may be 30 to 35 years before the flow demands approach the minimum monthly flow. In other words, a potential water imbalnce might arise toward the year 2010 or 2015 if the present growth trend of the economy continues and the water productivity relationship remain unchanged. Utilizing an alternative criterion based on consumptive flow demands rather than withdrawal flow demands to assess a potential water imbalance, it is anticipated that the NSRB may face a water imbalance around the year 2035, given the current and anticipated rates of resource consumption.

Even with a seasonal pattern for water demand superimposed on withdrawal uses, the results are more or less the same. That is, in this case, it is estimated that a water imbalance could emerge toward the year 2020. From a resource management point of view, the policy implications to be drawn from the foregoing analysis are clear: within

35 to 50 years either demand management or supply augmentation (e.g., flow regulation) may become necessary if water imbalance is to be rectified. In the medium term, however, water is unlikely to be a factor constraining economic growth in the NSRB.

CHAPTER VI

POLICY SIMULATION AND EVALUATION

Since the foregoing water demand projection model and subsequent forecasts have not explicitly incorporated dynamic factors such as new industries, water-using technological changes, and alternative policy measures that might arise in the future, it is essential to carry out policy simulations and sensitivity analysis within the framework of the model in order that the system's responsiveness to changes in these parameters can be evaluated. This would provide an assessment of impacts on water resources that may be associated with alternative policy scenarios.

Specific policy scenarios or technology assumptions to be examined in this section are: (1) a Cold Lake heavy oil development scenario involving a 4.7 billion dollar project proposal by Imperial Oil Company, (2) an irrigation feasibility scenario, (3) an oil and gas expansion scenario, (4) a petrochemical expansion scenario, and (5) a scenario involving change in the water technology assumption.

These in turn will be examined with respect to potential water resource impacts on the basin through policy simulations and evaluation.

Cold Lake Heavy Oil Development[1]

A major water using industry that might draw water from the North Saskatchewan River is heavy oil production in the Cold Lake region. Although a decision is yet to be finalized regarding the project proposal submitted by Imperial Oil Company in 1978, it is evident that, given its sheer size and the large amount of water required for oil recovery, the water implications are far reaching. In this section, the water resource impacts on the basin emanating from such as development will be quantitatively assessed.

With the decline of conventional oil field production in Alberta and the advent of the world energy crisis, interest in exploiting the vast underground heavy oil reserve trapped in the deep oil sand formation some 100 to 2000 feet underneath northeastern Alberta has increased.

The Cold Lake region, about 170 miles northeast of Edmonton is estimated to possess 164 billion barrels

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[1]The information in this section regarding the proposed size of plant operation, production capacity and water usage are based, in large part, upon the report Socio-Economic Overview of the Cold Lake Oil Project by Resource Management Consultants, 1978, particularly pp. 2-24.

of the reserve in the form of crude bitumen.[1] In 1976, Imperial Oil Company formally submitted to the Energy Resources Conservation Board (ERCB) an application for a large-scale heavy oil development project in the Cold Lake region, with an estimated capital cost of 4.7 billion dollars in 1978 prices. Construction of the project would take approximately five years, from 1980 to 1985. The proposed project would have a capacity of 160,000 barrels of heavy oil per day. Several public hearings on the proposed project were held in Grande Centre in late 1978 and early 1979 to assist the province in finalizing the decision.

Not only is this proposed project of importance to the energy development plan of the province but also the magnitude of water injection required for the recovery process is significant from a water resource point of view. The extraction of heavy oil would involve a substantial amount of water under the "in-situ" recovery method. The heavy oil recovery process, known as the "steam stimulation technique", involves the injection of large amounts of pressurized steam underground into the thick sand formation so that the raw bitumen of high

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[1] J. H. Nicholls and R. W. Luhning, "Heavy Oil Sand In-Situ Pilot Plants in Alberta," The Oil Sands of Canada-Venezuela, 1977, Canadian Institute of Mining and Metallurgy, 1978, p. 527.

viscosity is stimulated to flow to surface. The overall water to oil recovery ratio varies depending upon the specific physical and geological characteristics of the the oil well. However, based on a few pilot test drilling results from the region, as well as Imperial's own proposed water balance scheme, the ratio ranges between 5:1 and 10:1, implying that, on average, some 5 to 10 barrels of water are required to recover one barrel of crude oil. The heavy oil recovery method, therefore, is a highly water-intensive technique, almost 5 to 10 times higher in terms of water required per unit of production than enhanced recovery methods in conventional oil fields where the overall ratio is roughly 1:1.

According to the project proposal, the daily water requirements including boiler feed and cooling tower intake would amount to some 800,000 barrels for plant operations (53 cfs on an annual basis) of which roughly 70 percent would be in the form of fresh water. Such requirements are equivalent to about 40 percent of the total industrial water intake in the basin in 1972 and 23 percent of the expected total industrial withdrawal in 1985. There is no doubt that a Cold Lake operation of this magnitude would be the largest single user in the basin in the foreseeable future. In view of the water using nature of heavy oil recovery, there is mounting public concern over the continuous withdrawal of fresh water of such magnitude from Cold Lake, the source of supply that Imperial Oil views as its least

cost source.

The North Saskatchewan River was also considered by Imperial Oil as source of water to supply the Cold Lake project. During 1979, the provincial government may ascertain whether Cold Lake is indeed, in social as well as private cost terms, a cheaper source of water supply than water piped from the North Saskatchewan River. The analysis in this section will not address this specific question, but rather will focus on water requirements, water supply, and water balance in the NSRB, assuming that water from the North Saskatchewan River were to be the main source of supply for heavy oil recovery. In order to evaluate the impact of such a course of action, simulations based on the I-O water projection model were conducted under two broad assumptions: (1) an extreme water using case (Case A)--one half of the total projected oil and gas production level for 1985 as generated under the "Medium Scenario" would be assumed to be produced under the same water using technology as the Cold Lake project (this case would likely serve as an upper limit to future water resource requirements by the oil and gas industry), and (2) a realistic water using case (Case B)--15 percent of the total projected oil and gas production level of the basin for 1985 would be produced from the Cold Lake region, utilizing the high water using technology as described above, and the remaining 85 percent would be produced under the conventional water using technology of 1972.

The results of simulations in terms of withdrawal quantity are presented in Table 6-1.

TABLE 6-1

PROJECTED WATER REQUIREMENTS
DUE TO HEAVY OIL DEVELOPMENT
(million imperial gallons)

Industry	Case A (1985)			Case B (1985)		
	Low	Med	High	Low	Med	High
Oil and Gas	32,424	35,570	38,714	18,423	20,248	22,014
All Other Industries	24,965	31,264	38,189	24,965	31,264	38,189
Industry Total	57,389	66,834	76,903	43,388	51,512	60,203

In the extreme water using scenario, where at least half of the gross outputs are assumed to be produced under technology comparable to the Cold Lake operations, the industrial water intake requirement for the basin will be increased by 50 percent, reaching some 67 billion imperial gallons (344 cfs) in 1985 (medium scenario). As a result, total demands in the NSRB, including domestic usage, would be 35 percent higher than otherwise, reaching 442 cfs. Similarly, the low and

high scenarios resulted in 45 and 53 percent increases in total industrial water intake over the corresponding baseline cases.

From a water resource perspective, the implications of a highly water intensive heavy oil development are clear. The faster the pace of heavy oil development or, alternatively, the greater the dependence of overall energy supply upon heavy oil development projects such as the Cold Lake proposal, the sooner the province will be faced with a water imbalance. Even under a more realistic water using scenario, projected mining water use by 1985 would double solely due to the commencement of the Cold Lake operations, and consequently total industrial water requirements would increase by some 20 percent. These conclusions, however, are based on the assumption that the North Saskatchewan River, rather than Cold Lake, is the source of water supply for heavy oil production operations.

Irrigation Alternative

Because of climatic and soil conditions, irrigation of some 850,000 acres in Alberta is concentrated in the South Saskatchewan River Basin, mostly along the Bow, St. Mary and Oldman Rivers (Table 6-2). If similar irrigation practices were introduced in the NSRB, the impact on water resources would be significant.

TABLE 6-2

IRRIGATION IN ALBERTA BY DISTRICT, 1977

District	Acres Irrigable	Actually Irrigated
Aetna	3,081	2,500
Bow River	147,795	131,492
Eastern	224,967	208,785
Leavitt	4,430	4,430
Lethbridge N.	111,736	97,829
Magrath	9,480	7,000
Mountain View	3,720	2,000
Raymond	31,625	30,000
Ross Creek	1,319	350
St. Mary	274,301	237,660
Taber	68,178	64,115
United	33,617	15,000
Western	68,549	48,525
TOTAL	982,798	849,686

Source: Alberta Agriculture, Agriculture Statistics Yearbook, 1977.

Since the simulation involved is of a hypothetical nature, a scenario approach was taken whereby 90 percent of the total cereal grain production was assumed to be produced from conventional dryland operation while 10 percent was from irrigation operation. Water requirements, mostly consumptive, were assumed to be 1.5 acre feet per acre

irrigated.[1] Furthermore, it was assumed that the yield differential between dryland and irrigated would be roughly 1:2.[2] However, considering the basin's climate relative to the southern part of the province and subsequent effects on moisture balance in crop growing, another scenario was formulated in which the level of water requirements was assumed to be one-half of the above amount, i.e., 0.75 acre foot per acre.

For each of the four major cereal grain crops (wheat, barley, oilseeds, oats and other grain), if 10 percent of the projected level of production was met by irrigation and if water requirements were 1.5 acre feet per acre, industrial water demands would rise by more than five times (Table 6-3). Including all uses, both domestic and industrial, the water demands placed on the basin in 1980 and 1985 would rise to 217,043 and 258,166 million imperial gallons respectively rather than the projected 53,441 and 64,239 million without irrigation.

Even in this limited example of irrigation, the I-O water projection model indicated that water resource

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[1]M. Anderson, Economic Analysis of Water Supply Alternatives, Phase II, Oldman River Basin Study, 1978, Appendix G, p. A-59.

[2]Ibid., Appendix G, pp. 28-43.

TABLE 6-3

TOTAL WATER WITHDRAWAL DEMANDS, 1980 & 1985
INCLUDING A HYPOTHETICAL IRRIGATION
(million imperial gallons)

Major Group		1980	1985
Domestic	(A)	16,858	19,307
	(B)	16,858	19,307
Agricultural	(A)	167,915	199,046
	(B)	4,316	5,119
Non-Agricul.	(A)	32,267	39,813
	(B)	32,267	39,813
TOTAL	(A)	217,040	258,166
	(B)	53,441	64,239

Notes: Agriculture includes livestock, forestry and fishing as well as irrigated agriculture. The warer requirement for irrigated agriculture is assumed to be 1.5 acre-feet per acre. (A) above means the case with irrigation being included and (B) refers to the case with irrigation excluded. The above simulations are based on the Medium Scenario only.

demands could approach 217,000 to 258,000 million imperial gallons (1,100 cfs to 1,300 cfs in flow terms). This demand would far exceed the critical level of about 810 cfs, the flow that is available 95 percent of the time. Even assuming a moderate level of moisture requirement for irrigated crops,

the demand would be 700 to 900 cfs in 1980 and 1985.

The above calculation did not consider the wide seasonal fluctuations in flow availability. Since irrigation demands would occur only during May to September, it would be tantamount to a flow rate of 2,200 to 3,000 cfs over the growing period of May to September. As for the supply side of water resources, the North Saskatchewan River during May to September flows at a rate of 10,000 to 14,000 cfs, well above the monthly average. Since peak irrigation demands are synchronized with peak flow months, the pressure on the available flows is reduced. However, even strictly on a peak demand-to-peak supply basis, the irrigation demands alone would approach 2,027 cfs, almost 30 to 40 percent of the available flows of 5,000 to 7,000 cfs (net of apportionment requirements).

The introduction of irrigation in the North Saskatchewan River Basin would greatly increase the withdrawal and consumptive use of water in the basin and would lead to much earlier and intense water use conflicts and potential water shortages. However, there is little likelihood of much expansion of irrigation in Northern Alberta, given the relative superiority of expansion in Southern Alberta.

Expanded Oil and Gas Production

The petroleum resource has been a vital one for economic development and it is likely to continue so in the foreseeable future. In view of the importance attached

to these resources and, in particular its water-intensive recovery operations, a scenario is developed whereby a doubling of the 1972 final demands for such energy products as crude oil, natural gas, sulphur, petroleum refinery products and gas pipeline services is assumed to occur as early as 1980 or 1985. Implications this might have on water resources can be assessed. All other categories of final demands except the above-mentioned energy products were set at the preassigned level, as in the Medium Scenario. The results of simulations obtained under these scenarios were compared with those results from the Medium Scenario Cases in which all the sectors of final demands are assumed to progress at a normal expected rate. This indicates the changes in water resource demands if the external demands on energy-related products were to rise by an unusually large proportion and production of energy resources were to respond to this demand increase.

As shown in Table 6-4, the total industrial water

TABLE 6-4
INDUSTRIAL WATER WITHDRAWAL DEMANDS, NSRB
UNDER A DOUBLING OF ENERGY DEMANDS OVER 1972
(million imperial gallons)

Industry Group	1980	1985
Mining	22,731	23,548
Manufacturing	17,749	21,948
All Others	6,197	7,388
TOTAL	46,677	52,884

Note: Based on the Medium Scenario except for the energy-related products which are set at double the 1972 final demands.

withdrawal demands for the basin are likely to rise by some 10 billion gallons, or 28 percent higher than it would otherwise be, if a doubling of energy demands were to occur in 1980. The mining sector, particularly crude oil and gas, would bear the brunt of this increased production and consequently of the increased water demands, which would amount to almost 80 percent of the total 10 billion gallons of increase. The manufacturing sector, mostly oil refineries, would realize the remaining 20 percent of the increase. The extent of inter-industrial demands for water induced by this initial change does not appear to be significant as compared to the primary resource impacts on water.

If a doubling of energy demands by exogenous sectors were to occur in 1985, the water withdrawal demands would reach 52.9 billion gallons, an increase of 8 billion or 18 percent over the forecasted under a most plausible scenario (Medium Scenario). Of this increase, 84 percent is accounted for by the mining industry and the rest by the manufacturing industry.

Petrochemical Industry Expansion Alternative

The increasing emphasis placed by the provincial government and private industries on rapid expansion of a petrochemical industries base in Alberta will have water demand implications. These can be studied by hypothesizing a four-fold increase in 1985 over the 1972 level, as

opposed to a two-fold increase as assumed under the Medium Scenario. Petrochemical industries in general, including fertilizer, are occupying a pivotal position in the overall industrial strategy of the province, and they are relatively heavy water using industries.

Table 6-5 shows that the total industrial demands can be increased to approximately 48.6 billion gallons in 1985 or 85 percent increase over the 1972 level. Particularly significant are the expected increases in water demands associated with manufacturing industries (in particular, chemical industries) that would total 24.2 billion gallons or

TABLE 6-5

PROJECTED INDUSTRIAL WATER WITHDRAWALS

ASSOCIATED WITH GREATER PETROCHEMICAL EXPANSION

(million imperial gallons)

Industry	1972	1985 Petrochemical expansion alternative	1985 Normal medium scenario
Agriculture	3,273	5,124	5,120
Mining	11,572	17,002	16,839
Manufacturing	10,055	24,245	20,758
Construction	57	106	106
Transportation	134	201	200
Utilities	264	620	616
Services	856	1,298	1,290
TOTAL	26,211	48,595	44,932

2.4 times the 1972 level, compared to about two-fold increase under the Medium Scenario. Thus, the impact of a rapid development of petrochemical industries would exert substantial additional resource demands not only on the industries directly affected but also on the mining industries indirectly related through backward linkages.

Water Using Industrial Technology

Assumptions

Water is considered an essential input to the industrial production process as a cooling medium, as a processing medium or as directly incorporated into manufactured products. However, the cost of water to industry is small, almost negligible. It may range from 0.02 percent of the production costs for the metal fabricating industry to 0.4 percent for the chemical industry.[1] Such insignificant charges relative to total costs result in small price elasticities, although accurate estimates are not available, largely because industrial users usually supply their own water.

There is evidence that for some categories of municipal and domestic water uses, such as lawn watering,

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[1]John Knapp, "Economics of Industrial Water Use in Alberta," Unpublished Thesis, 1973, Univeristy of Alberta, p. 53.

demand might be price elastic,[1] but empirical estimates of price elasticities vary widely even for these uses. The public generally feels that water should be provided free or at a token fee, especially in water rich countries such as Canada.

In order to study the response of industrial water use to changes in water use technology that might result from a change in prices, a sensitivity analysis was conducted. The impact of water-using or water-saving technological change on on water withdrawal was simulated by hypothesizing a 25 percent upward or downward adjustment in some key water use coefficients over the 1972 values. Eight major water using industries--oil and gas, meat processing, primary metal, metal fabricating, petroleum refining, petrochemical, fertilizer and power generation-- were studied.

The direction of change in water-using technology of an industry may depend on water pricing policies, input substitutability, and the degree of resource availability in relation to competing demands in a particular region. In a semi-arid region, there will be pressure toward conserving water and encouraging the use of water-saving technology either through pricing policy or institutional arrangements.

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[1] S. T. Wong, "A Model on Municipal Water Demand: A Case Study of Northeastern Illinois," Land Economics, Vol. XLVIII, February, 1972, pp. 34-44.

The purpose of this simulation is to quantify the impacts stemming from a change in water-saving technology by major industries. This is particularly significant to policy formulation because if overall impacts were found to be significant, resource planners would be able to concentrate on formulating water policies and using various policy instruments to encourage water-using industries to adopt water-conserving technology.

The initial simulation was performed with water use coefficients reduced by 25 percent by 1980 or 1985. Categories of final demands were as in the Low, Medium and High scenarios. The second simulation was similar except the 1972 water coefficients were increased by 25 percent. The results of the simulations are presented in Tables 6-6 and 6-7.

It appears that a 25 percent reduction in water coefficients for the eight major industries would reduce water demands in the basin by seven billion gallons or 14 percent for 1980 or by nine billion gallons or 15 percent for 1985, compared to the baseline projections. Conversely, an increase of 25 percent in the water coefficients would increase water demands by seven billion gallons for 1980 and ten billion gallons for 1985.

As shown in Table 6-6 and 6-7, there will be greatest impacts on water requirements in such sectors as mining, manufacturing and utilities, which are shown to be affected by as much as 23 to 26 percent in terms of water

TABLE 6-6

TOTAL INDUSTRIAL WATER INTAKE DEMANDS ASSOCIATED WITH A 25 % REDUCTION IN WATER COEFFICIENTS FOR EIGHT MAJOR WATER USING INDUSTRIES

(million imperial gallons)

Major Industry Group	1980			1985		
	Low	Med	High	Low	Med	High
Agriculture	3,678	4,316	4,977	3,949	5,120	6,371
Mining	10,198	10,959	11,747	11,225	12,630	14,040
Manufact.	10,569	12,195	13,923	12,776	15,952	19,528
Construction	77	84	90	94	106	119
Tranport.	157	171	185	174	200	228
Utilities	284	342	370	355	467	550
Services	1,012	1,100	1,195	1,125	1,290	1,471
TOTAL	25,976	29,169	32,489	29,702	35,765	42,311

TABLE 6-7

TOTAL INDUSTRIAL WATER INTAKE DEMANDS ASSOCIATED WITH A 25 % INCREASE IN WATER COEFFICIENTS FOR EIGHT MAJOR WATER USING INDUSTRIES

(million imperial gallons)

Major Industry Group	1980 Low	1980 Med	1980 High	1985 Low	1985 Med	1985 High
Agriculture	3,678	4,317	4,977	3,949	5,120	6,371
Mining	16,995	18,262	19,576	18,706	21,048	23,395
Manufact.	16,904	19,505	22,272	20,483	25,567	31,309
Construction	77	84	90	94	106	119
Transportation	157	171	185	174	200	228
Utilities	665	802	869	834	1,099	1,292
Services	1,012	1,100	1,195	1,125	1,290	1,471
TOTAL	39,488	44,242	49,166	45,368	54,432	64,190

intake as a result of potential water use technological change.

Policy Scenario Conclusions

Among the various policy scenarios and their respective water implications that have been studied, the irrigation alternative seems to be most costly in terms of water impacts on the basin. This could tip the water balance of the basin by increasing the total water resource demand by as much as four to five times. However, this scenario is highly unlikely in the foreseeable future, given the alternative expansion potential for irrigation in southern Alberta.

The economic activity that might create the next highest water impacts in the future is Cold Lake heavy oil development. Accelerated heavy oil development, over and above the current Imperial Oil proposal, would increase the water resource demands in the basin by some 22 billion imperial gallons or by 35 percent in 1985. Even under the moderate scenario as currently projected heavy oil development, the water resource demands are expected to increase by seven billion imperial gallons or by ten percent by 1985. It is almost certain that the Cold Lake project will be implemented as scheduled, although the water source is yet to be determined; however, if water is drawn from the North Saskatchewan River, an additional water resource demand of approximately seven billion imperial gallons per year

would be placed upon the basin.

Another highly plausible scenario is one of rapid expansion of the petrochemical base, which would entail an additional four billion imperial gallons of water according to our simulations. This scenario is a highly likely event considering the availability of petrochemical feedstocks in the basin and in the province.

Prospective change in water using technology is speculative within the time frame under study, particularly given the very limited impact water pricing policy is apt to have on industrial water use. However, in the long run, only this alternative allows for the easing of the demand pressure on water resources if relative abundance of water within the basin changes in the future.

Finally, by 1985, some combination of the above scenarios might materialize simultaneously--namely, the current Cold Lake project with moderate water use as in Case (B), and a petrochemical expansion scenario. Given this likely set of scenarios, the additional water resource demands generated in the basin would be in the order of 11 billion imperial gallons per year or 56 cfs in flow terms.

CHAPTER VII

SUMMARY AND CONCLUSIONS

The objective of this thesis was to study the quantitative aspects of future water balance in the North Saskatchewan River Basin for the period, 1980-1985. A regional input-output model based on 1972 data was generated and then used to determine whether or not a potential water imbalance might be expected to occur in the foreseeable future. This was accomplished by firstly forecasting a range of total water demands in terms of withdrawal uses and consumptive uses under three economic scenarios, and then relating these quantities of forecasted demands to long term average streamflows in the river. The results of this study will be instrumental in contributing to the establishment of a long range water management plan for the basin.

The major analytical tool employed in this study was a basin-wide regional input-output model compiled in the new rectangular format. This new format permitted more useful examination of critical economic parameters such as impact multipliers, regional income accounts, patterns of regional trade, and industrial linkages. In addition, by superimposing a water technology matrix for the basin, a water use interaction table was generated out of the input-output information which provided for the structural analysis

of water characteristics of the basin economy.

A few of the interesting aspects of the regional economy as revealed by the input-output model are summarized as follows:

1. The basin economy appears to depend heavily upon the exports of primary products, mostly grains, oil and gas, and petroleum products as opposed to highly manufactured products. Imports consist mainly of secondary manufactured goods. This pattern of regional trade may suggest that from an economic structure point of view, the basin economy has yet to realize the potential inter-industry linkages by shifting towards the high linkage manufacturing sector (of course, there are other economic aspects--especially the size of the regional domestic market, accessibility to the national market, transportation costs etc. --which must be considered before advocating such a shift).

2. When measured in terms of multiplier effects on gross outputs of the economy, the beef and meat processing sector is shown to have the largest multiplier (2.98) among all sixty five commodity sectors comprising the regional economy. In general, it can be observed that the manufacturing sectors tend to be associated with a relatively higher value of the multiplier (ranging between 2.1 to 2.7) than the agriculture and service sectors which showed an average or below average multiplier value. This set of parameters could be useful as one possible criterion to decide upon

industrial development priorities in the province.

3. The regional economy as measured in terms of real GDP is expected to grow at an average annual rate of 3.8 to 4.0 percent over the 1980-1985 period, slightly surpassing the Canadian average which is forecasted.

4. With regard to the future growth of the economy, the leading growth sectors were identified as manufacturing, construction and power generation. The annual growth rates forecasted for these sectors range between 6.0 to 8.0 percent, far exceeding the overall pace of the economy. Although new heavy oil developments in the Cold Lake area may, to some extent, compensate for the gradually declining conventional oil reserves in the future, the total crude oil and gas production in the basin will, at best, level off during the period, 1980-1985.

Regarding the forecasts of total water demands likely to arise from future economic activities, it is expected that total withdrawals within the basin would increase by 35 percent and 61 percent (Medium Scenario) in 1980 and 1985 respectively over the 1972 level to reach 53,441 and 64,239 million imperial gallons. Almost seventy percent would be accounted for by the industrial sector and thirty percent by the domestic sector. Total consumptive water demands within the basin, defined as withdrawals minus discharge, are expected to increase from 18,809 million imperial gallons in 1972 to 24,736 and 29,317 million in 1980 and 1985 respectively, increases of 31 percent and 56 percent.

Comparing future withdrawal demands to the minimum monthly streamflow which can be expected to be equalled or exceeded 95 percent of the time, total demands by all sectors in the basin in 1980 will reach 272 cfs or 34.3 percent of 810 cfs which is half of the minimum monthly flow of 1,620 cfs in February (due to the inter-provincial apportionment requirement). Similarly, the demands forecasted for 1985 would be 327 cfs or 40 percent of the half of the minimum monthly flow. If consumptive use is utilized as the measure of demand, the total requirement for water would amount to 127 cfs in 1980 and 150 cfs in 1985 or some 15.7 percent and 18.5 percent respectively, of the minimum monthly streamflow, taking into account inter-provincial apportionment requirements.

If the forecasted water resource demands as measured by withdrawal uses are extrapolated into the future beyond 1985, it can be tentatively concluded that given the present flow characteristics of the stream and the present growth trends of the basin economy, it would take approximately thirty to thirty five years before total demands would approach the critical level of minimum flow. This would mean that with the current pace of regional economic growth extending into the future, the threshhold value for potential water imbalance could likely occur around the year 2015. However, in the event that the most likely set of scenarios--the Cold Lake heavy oil project plus rapid petrochemical expansion --would materialize simultaneously during the projection

period, the threshold value could occur around the year 2005 because of their water-intensive operations.

If consumptive use is taken as a criterion in assessing the water balance, a potential imbalance could occur around the year 2035 if the forecasted rate of water consumption continues into the future.

Several qualifications should be borne in mind, however, with respect to the use of projected water requirements provided in this thesis. Firstly, in the present study, price elasticities were not considered in the projections of water use, and therefore, to the extent that demand for water is price-responsive (perhaps with increasing scarcity of water over time and the possibility of much higher price levels for water), the water requirements forecasted for the basin will be overstated. Secondly, as pointed out in chapter III concerning the treatment of imports and inventory in the present study, the multipliers derived for the basin I-O model will be overstated if, as is highly likely, the proportion of regional supply provided by regional imports is higher for the basin than for the province. Accordingly, the value of projected water requirements will be over-estimated since water projections are based on projected gross outputs. Because the possible biases in projections are primarily in an upward direction, the projected water requirements should be interpreted as an indication of an

upper bound to total water resource requirements likely to arise in the future.

A further factor, on the supply side, that might mitigate the potential water shortage in the basin in the future is the fact that the historical average streamflows based on the 1911-1976 data could, to some extent, be modified in the future by the operation of Big Horn and Brazeau Dams upstream. The impact of these dams will tend to reduce seasonal variation in streamflows and, hence, to increase potentially available water supplies in the low-flow winter months. As more data on water supply patterns since the completion of these dams becomes available in the future, the question of potential water shortage can be re-examined.

The water resource implications that can be drawn from this study are the following. In terms of water quantities, it appears that in the short and medium run, there is little possibility of water shortage in the North Saskatchewan River Basin and little likelihood that regional growth will be seriously impaired by inadequate water supplies. In the long run, however, either flow regulation or demand management may become necessary if continued growth of the basin economy is to be assured.

The crucial water management problems that will emerge in the basin in this century will be related to water quality issues rather than water quantity. In

particular, water quality problems associated with thermal discharge as well as petrochemical and heavy industrial effluents will deserve more policy attention.

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APPENDIX A

LIST OF MUNICIPALITIES IN THE BASIN

TABLE A-1

LIST OF MUNICIPALITIES IN

THE NSRB BASIN

Municipalities	Census Divisions
Cities	
Camrose	10
Edmonton	11
Lloydminster (part)	10
St. Albert	11
Wetaskiwin	11
Towns	
Bonnyville	12
Calmar	11
Castor	7
Cold Lake	12
Daysland	7
Devon	11
Drayton Valley	11
Elk Point	12

TABLE A-1 (continued)

Municipalities	Census Divisions
Fort Saskatchewan	11
Grand Centre	12
Hardisty	7
Killam	7
Lacombe	9
Lamont	10
Leduc	11
Morinville	11
Mundare	10
Ponoka	8
Provost	7
Redwater	13
Rimbey	8
Rocky Mountain House	8
Sedgewick	7
Smokey Lake	12
Spruce Grove	11
Stettler	7
Stoney Plain	11
St. Paul	12

TABLE A-1 (continued)

Municipalities	Census Divisions
Tofield	10
Two Hills	10
Vegreville	10
Vermillion	10
Viking	10
Wainwright	7
Villages	
Alliance	7
Amisk	7
Andrew	10
Bawlf	10
Bug Valley	7
Bittern Lake	10
Bon Accord	11
Botha	7
Breton	11
Bruderheim	10
Caroline	8
Chauvin	7
Chipman	10
Clyde	13

TABLE A-1 (continued)

Municipalities	Census Divisions
Czar	7
Derwnt	10
Dewberry	10
Edgerton	7
Ferintosh	10
Forestburg	7
Gadsby	7
Galahad	7
Gibbons	11
Glendon	12
Hairy Hill	10
Halkirk	7
Hay Lakes	10
Heisler	7
Holden	10
Hughenden	7
Innisfree	10
Irma	7
Kitscoty	10
Lavoy	10
Legal	11

TABLE A-1 (continued)

Municipalities	Census Divisions
Ma-Me-O Beach	11
Manneville	10
Marwayne	10
Millet	11
Minburn	10
Myrnam	10
New Norway	10
New Sarepta	11
Onoway	13
Paradise Valley	10
Radway	13
Rosalind	10
Ryley	10
Strome	7
Thorhild	13
Thorsby	11
Vilna	12
Warspite	12
Waskatenau	12
Willingdon	10

APPENDIX B

INPUT-OUTPUT SECTORAL CLASSIFICATIONS

TABLE B-1

COMMODITY CLASSIFICATIONS

Commodity Number and Title	Provincial I-O Classifications	Statistics Canada I-O Classifications
1. Wheat, unmilled	1	7
2. Barley, unmilled	1	8
3. Oilseeds	1	18
4. Other cereal crops	1	8,16
5. Hay,forage & straw	2	15
6. Livestock	2	1, 2, 3, 5
7. Poultry	2	4
8. Eggs in shell	2	10
9. Milk & Cream, unproc.	2	9
10. Other agri prod.	1,2	11,12,13,14,21,22,23.
11. Forest products	3	24 - 28.
12. Fishing,hunting & trapping	4	29 - 30.
13. Coal	8	37
14. Crude oil	5	38
15. Natural gas	6	39
16. Sulphur	7	41
17. Other mineral prod.	11	34-36,40,42-51.
18. Beef,pork & other meats.	12	52-66.
19. Fluid milk & dairy proc.	13	67-74.
20. Feeds manufacture	15	85-89.
21. Vegetable oil & prod.	20	104
22. Flour,cereal & bakery prod.	16,17,18,20.	90-95.

COMMODITY CLASSIFICATIONS (continued)

23. Soft drink product	19	114,115
24. Beers & alcoholic prod.	21	116-120.
25. Other food prod. n.e.s.	20	96-99,105-113.
26. Tires & tubes	23	125-128
27. Other rubber prod.	24	124,129-138.
28. Leather prod.	25	139-144.
29. Textile prod.	26,27,28(part)	145-179.
30. Hosiery & knitted prod.	28(part)	180-183.
31. Clothing	29	184-189.
32. Lumber & plywood prod.	30	190-195
33. Wood prod. n.e.s.	31	196-203.
34. Furniture & fixtures	32	204-208.
35. Pulp & paper prod.	34-38.	209-227.
36. Printing & publish prod.	39	228-234.
37. Iron & steel prod.	40	235-252.
38. Other primary metal prod.	41-44	253-271.
39. Metal fabricated prod.	45	272-298,300-313.
40. Machinery products	46-47.	314-329
41. Vehicles & other transp equip.	48,49,50.	330-352.
42. Appliances, electrical	51-52.	299,353-357,358-374.
43. Cement	53	375
44. Other non-metallic prod.	53,54	376,377-379,380-393.
45. Petroleum & coal, refined.	55,56	394-396,245,397-402,548.
46. Fertilizers	58	403
47. Chemical & chemical prod.	57,59,60	105,117,404-408,411,416-470, 473,474,479,480,409,410, 412-415,471,472,475-478,481-496.
48. Miscellaneous manufact.	61,62,63	497-503,504-521.
49. New construction	64-70.	523-529.
50. Repair construction	71	522

COMMODITY CLASSIFICATIONS(continued)

51. Transportation services	72-73.	530-541.
52. Storage services	72(part)	542
53. Communication services	74	543-545.
54. Electric power	75	546
55. Gas pipeline serv.	76	547
56. Water & other utilities	77	549
57. Wholesale trade	78	550
58. Retail trade	79	553
59. Finance,insurance & other	80	554-556,560.
60. Real estate rental	81	557,559.
61. Education services	82(part)	561
62. Health services	82(part)	562-563.
63. Accomodation & food serv.	82(part)	569-571
64. Business services	83	566-567,575-576.
65. Personal services	82(part),83.	564,551-552,568,572-574,577-579,595.

TABLE B-2

INDUSTRIAL CLASSIFICATIONS

Industry Number and Title	Provincial I-O Classifications	Standard Industrial Classifications
1. Wheat producers	1	001,003,013,017.
2. Barley producers	1	001,003,013,017.
3. Oilseeds producers	1	001,003,013,017.
4. Other grains prod.	1	001,003,013,017.
5. Forage producers	1	001,003,013,017.
6. Livestock producers	1	001,003,011,017.
7. Poultry & egg prod.	1	001,003,011,017.
8. Dairy producers	1	001,003,011,017.
9. Other agricult prod.	1	001,003.
10. Forestry products prod.	2	031,039.
11. Fishing,hunting & trap	3	041,047.
12. Coal mining industry	4	061.
13. Petroleum,crude & nat. gas	5	064.
14. Other mining ind.	6,7	058,059,072,073,079, 083,087.
15. Slaughter,meat & poul. proc.	8,9	101.
16. Dairy factory	10	104.
17. Feeds manufacturer	11	106.
18. Flour,cereal & bake ind.	12,13,14	105,107.
19. Vegetable oil mills ind.	17	108.
20. Soft drinks manuf.	15	109(part).
21. Alcohol. beverage & brew.	16	109(part).
22. Other food ind.	17	102,103,108.

INDUSTRIAL CLASSIFICATIONS(continued)

23. Rubber products ind.	18	162
24. Leather products ind.	18	172,174,175,179.
25. Textile industries	19,20,21	181 - 189.
26. Knitting mill ind.	21	231,239.
27. Clothing industries	22	243,249.
28. Wood products ind.	23-28.	251,252,254,256,258,259.
29. Furniture & fixtures	29,30.	261,264,266,268.
30. Pulp & paper prod. ind.	31,32,33 (part),35.	271 - 274.
31. Printing & publish.	34	285 - 289.
32. Primary metal ind.	36,37.	291,292,294,295,296.
33. Metal fabricated.	38-43.	301 - 309.
34. Machinery prod. ind.	46-48.	311,315,318.
35. Transport equip. ind.	49-53.	321,323,324,325,329.
36. Electrical equip & appliance	54	331-333,335,336,339.
37. Cement manuf. ind.	58	352
38. Concrete prod. ind.	55	354
39. Ready-mix manuf. ind.	56	355
40. Other non-metal prod. ind.	57,58	351,353,356,359
41. Petroleum & coal, refined.	59,60	355,359.
42. Fertilzer manuf. ind.	64	372
43. Chemical & related ind.	61-63,64(part)	373-379.
44. Miscellaneous manuf. ind.	65-71.	391-399.
45. New construction ind.	72	401-421.
46. Repair construction ind.	72	401-421.
47. Transport service ind.	73,74	501-503,505-509,512,515,516, 517,519.
48. Storage services ind.	75	523,527.
49. Communication services ind.	76,77,78	543,544,545,548.
50. Electric generation ind.	79	572

INDUSTRIAL CLASSIFICATIONS(continued)

51. Gas distribution serv. ind.	80	574
52. Water & other utilities	81	575,579.
53. Wholesale trade ind.	82	602,606,608,611,612,614, 616,617,618,619,621,622, 623,624,626,627,629.
54. Retail trade ind.	82	631,642,652,654,656,658, 663,665,667,669,673,676, 678,681,691,692,694-697, 699.
55. Finance,insurance & real est.	83(part)	701,703,705,707,715,721, 735.
56. Real Estate rentals	83(part)	737.
57. Education & related ind.	84	801 - 809.
58. Hospital & health serv. ind.	85	821 - 827.
59. Accomodation & food serv. ind.	91	881,883,884,885.
60. Business serv. ind.	88,94(part) 95.	851,853,855,861,862,863, 864,866,867,869.
61. Personal service ind.	87,90,94(part).	841-845,849,871-874, 876,877,879.

APPENDIX C

KEY INPUT-OUTPUT TABLES FOR THE NSRB ECONOMY, 1980-1985

TABLE C1 DOMESTIC MARKET SHARE COEFFICIENTS

PAGE

		WHEAT, UNMILLED 1	BARLEY, UNMILLED 2	OIL SEEDS 3	OTH CEREAL CROPS 4	HAY, FORAGE 5	LIVESTOCK 6
WHEAT PRODUCERS	1	1.0000000	0.0	0.0	0.0	0.0092773	0.0
BARLEY PRODUCERS	2	0.0	1.0000000	0.0	0.0	0.0090184	0.0
OIL SEEDS PRDRS	3	0.0	0.0	1.0000000	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.9928527	0.0119252	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0071473	0.9698076	0.0
LIVESTOCK PRDRS	6	0.0	0.0	0.0	0.0	0.0	0.9848985
POULTRY & EGG PRDRS	7	0.0	0.0	0.0	0.0	0.0	0.0
DAIRY PRODUCERS	8	0.0	0.0	0.0	0.0	0.0	0.0151015
OTH AG PRDRS	9	0.0	0.0	0.0	0.0	0.0	0.0
FORESTRY PRDRS	10	0.0	0.0	0.0	0.0	0.0	0.0
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.0	0.0	0.0	0.0	0.0	0.0
CRUDE OIL & GAS IND	13	0.0	0.0	0.0	0.0	0.0	0.0
OTH MINING IND	14	0.0	0.0	0.0	0.0	0.0	0.0
MEAT PROC IND	15	0.0	0.0	0.0	0.0	0.0	0.0
DAIRY INDUSTRY	16	0.0	0.0	0.0	0.0	0.0	0.0
FRDS MFR IND	17	0.0	0.0	0.0	0.0	0.0	0.0
FLOUR CER BAKERY IND	18	0.0	0.0	0.0	0.0	0.0	0.0
VEGETABLE OIL MILLS	19	0.0	0.0	0.0	0.0	0.0	0.0
SOFT DRINKS MFR IND	20	0.0	0.0	0.0	0.0	0.0	0.0
BEERS & ALC MFR IND	21	0.0	0.0	0.0	0.0	0.0	0.0
OTH FOOD MFR IND	22	0.0	0.0	0.0	0.0	0.0	0.0
RUBBER PROD IND	23	0.0	0.0	0.0	0.0	0.0	0.0
LEATHER PROD IND	24	0.0	0.0	0.0	0.0	0.0	0.0
TEXTILE PROD IND	25	0.0	0.0	0.0	0.0	0.0	0.0
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.0	0.0	0.0	0.0	0.0	0.0
WOOD PROD IND	28	0.0	0.0	0.0	0.0	0.0	0.0
FURNITURE IND	29	0.0	0.0	0.0	0.0	0.0	0.0
PULP & PAPER IND	30	0.0	0.0	0.0	0.0	0.0	0.0
PRINTING & PUBL IND	31	0.0	0.0	0.0	0.0	0.0	0.0
PRIMARY MET IND	32	0.0	0.0	0.0	0.0	0.0	0.0
METAL FAB IND	33	0.0	0.0	0.0	0.0	0.0	0.0
MACHINERY IND	34	0.0	0.0	0.0	0.0	0.0	0.0
TRANSP EQUIP IND	35	0.0	0.0	0.0	0.0	0.0	0.0
ELECTR APPL IND	36	0.0	0.0	0.0	0.0	0.0	0.0
CEMENT MFR IND	37	0.0	0.0	0.0	0.0	0.0	0.0
CONCRETE PROD IND	38	0.0	0.0	0.0	0.0	0.0	0.0
READY MIX MFR IND	39	0.0	0.0	0.0	0.0	0.0	0.0
OTH NON-METAL IND	40	0.0	0.0	0.0	0.0	0.0	0.0
PETROLEUM & COAL IND	41	0.0	0.0	0.0	0.0	0.0	0.0
FERTILIZER MFR IND	42	0.0	0.0	0.0	0.0	0.0	0.0
CHEMICAL & REL IND	43	0.0	0.0	0.0	0.0	0.0	0.0
MISC MFR IND	44	0.0	0.0	0.0	0.0	0.0	0.0
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.0	0.0	0.0	0.0	0.0	0.0
TRANSP SERV IND	47	0.0	0.0	0.0	0.0	0.0	0.0
STORAGE SERV IND	48	0.0	0.0	0.0	0.0	0.0	0.0
COMMUNIC SERV IND	49	0.0	0.0	0.0	0.0	0.0	0.0
ELECTRICAL POWER	50	0.0	0.0	0.0	0.0	0.0	0.0
GAS DISTRIB IND	51	0.0	0.0	0.0	0.0	0.0	0.0
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.0	0.0	0.0	0.0	0.0	0.0
RETAIL TRADE	54	0.0	0.0	0.0	0.0	0.0	0.0
FINANCE	55	0.0	0.0	0.0	0.0	0.0	0.0
REAL ESTATE RENTAL	56	0.0	0.0	0.0	0.0	0.0	0.0
EDUCATION & RELATED	57	0.0	0.0	0.0	0.0	0.0	0.0
HOSPITAL & HEALTH	58	0.0	0.0	0.0	0.0	0.0	0.0
ACCOM & FOOD SERV	59	0.0	0.0	0.0	0.0	0.0	0.0
BUSINESS SERV IND	60	0.0	0.0	0.0	0.0	0.0	0.0
PERSONAL SERV IND	61	0.0	0.0	0.0	0.0	0.0	0.0
SUM		1.0000000	1.0000000	1.0000000	0.9999999	1.0000200	1.0000000

TABLE C-1 DOMESTIC MARKET SHARE COEFFICIENTS (CONTINUED)

		POULTRY 7	EGGS IN SHELL 8	MILK, CREAM UNF 9	OTH AG PROD 10	FOREST PROD 11	FISHING, H & T 12
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.0	0.0	0.0	0.0	0.0	0.0
POULTRY & EGG PRDRS	7	1.0000000	1.0000000	0.0	0.0	0.0	0.0
DAIRY PRODUCERS	8	0.0	0.0	1.0000000	0.0	0.0	0.0
OTH AG PRDRS	9	0.0	0.0	0.0	1.0000000	0.0	0.0
FORESTRY PRDRS	10	0.0	0.0	0.0	0.0	1.0000000	0.0
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	1.0000000
COAL MINING IND	12	0.0	0.0	0.0	0.0	0.0	0.0
CRUDE OIL & GAS IND	13	0.0	0.0	0.0	0.0	0.0	0.0
OTH MINING IND	14	0.0	0.0	0.0	0.0	0.0	0.0
MEAT PROC IND	15	0.0	0.0	0.0	0.0	0.0	0.0
DAIRY INDUSTRY	16	0.0	0.0	0.0	0.0	0.0	0.0
FEEDS MFR IND	17	0.0	0.0	0.0	0.0	0.0	0.0
FLOUR GRP BAKERY IND	18	0.0	0.0	0.0	0.0	0.0	0.0
VEGETABLE OIL MILLS	19	0.0	0.0	0.0	0.0	0.0	0.0
SOFT DRINKS MFR IND	20	0.0	0.0	0.0	0.0	0.0	0.0
BEERS & ALC MFR IND	21	0.0	0.0	0.0	0.0	0.0	0.0
OTH FOOD MFR IND	22	0.0	0.0	0.0	0.0	0.0	0.0
RUBBER PROD IND	23	0.0	0.0	0.0	0.0	0.0	0.0
LEATHER PROD IND	24	0.0	0.0	0.0	0.0	0.0	0.0
TEXTILE PROD IND	25	0.0	0.0	0.0	0.0	0.0	0.0
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.0	0.0	0.0	0.0	0.0	0.0
WOOD PROD IND	28	0.0	0.0	0.0	0.0	0.0	0.0
FURNITURE IND	29	0.0	0.0	0.0	0.0	0.0	0.0
PULP & PAPER IND	30	0.0	0.0	0.0	0.0	0.0	0.0
PRINTING & PUBL IND	31	0.0	0.0	0.0	0.0	0.0	0.0
PRIMARY MET IND	32	0.0	0.0	0.0	0.0	0.0	0.0
METAL FAB IND	33	0.0	0.0	0.0	0.0	0.0	0.0
MACHINERY IND	34	0.0	0.0	0.0	0.0	0.0	0.0
TRANSP EQUIP IND	35	0.0	0.0	0.0	0.0	0.0	0.0
ELECTR APPL IND	36	0.0	0.0	0.0	0.0	0.0	0.0
CEMENT MFR IND	37	0.0	0.0	0.0	0.0	0.0	0.0
CONCRETE PROD IND	38	0.0	0.0	0.0	0.0	0.0	0.0
READY MIX MFR IND	39	0.0	0.0	0.0	0.0	0.0	0.0
OTH NON-METAL IND	40	0.0	0.0	0.0	0.0	0.0	0.0
PETROLEUM & COAL IND	41	0.0	0.0	0.0	0.0	0.0	0.0
FERTILIZER MFR IND	42	0.0	0.0	0.0	0.0	0.0	0.0
CHEMICAL & REL IND	43	0.0	0.0	0.0	0.0	0.0	0.0
MISC MFR IND	44	0.0	0.0	0.0	0.0	0.0	0.0
NON CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.0	0.0	0.0	0.0	0.0	0.0
TRANSP SERV IND	47	0.0	0.0	0.0	0.0	0.0	0.0
STORAGE SERV IND	48	0.0	0.0	0.0	0.0	0.0	0.0
COMMUNIC SERV IND	49	0.0	0.0	0.0	0.0	0.0	0.0
ELECTRICAL POWER	50	0.0	0.0	0.0	0.0	0.0	0.0
GAS DISTRIB IND	51	0.0	0.0	0.0	0.0	0.0	0.0
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.0	0.0	0.0	0.0	0.0	0.0
RETAIL TRADE	54	0.0	0.0	0.0	0.0	0.0	0.0
FINANCE	55	0.0	0.0	0.0	0.0	0.0	0.0
REAL ESTATE RENTAL	56	0.0	0.0	0.0	0.0	0.0	0.0
EDUCATION & RELATED	57	0.0	0.0	0.0	0.0	0.0	0.0
HOSPITAL & HEALTH	58	0.0	0.0	0.0	0.0	0.0	0.0
ACCOM & FOOD SERV	59	0.0	0.0	0.0	0.0	0.0	0.0
BUSINESS SERV IND	60	0.0	0.0	0.0	0.0	0.0	0.0
PERSONAL SERV IND	61	0.0	0.0	0.0	0.0	0.0	0.0
SUM		1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000

TABLE C-1 DOMESTIC MARKET SHARE COEFFICIENTS (CONTINUED)

		COAL 13	CRUDE OIL 14	NATURAL GAS 15	SULPHUR 16	OTH MIN PROD 17	BEEF, PORK ETC. 18
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.0	0.0	0.0	0.0	0.0	0.0
POULTRY & EGG PRDRS	7	0.0	0.0	0.0	0.0	0.0	0.0
DAIRY PRODUCERS	8	0.0	0.0	0.0	0.0	0.0	0.0
OTH AG PRDRS	9	0.0	0.0	0.0	0.0	0.0	0.0
FORESTRY PRDRS	10	0.0	0.0	0.0	0.0	0.0	0.0
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	1.0000000	0.0	0.0	0.0	0.0	0.0
CRUDE OIL & GAS IND	13	0.0	1.0000000	1.0000000	1.0000000	0.0	0.0
OTH MINING IND	14	0.0	0.0	0.0	0.0	1.0000000	0.0
MEAT PROC IND	15	0.0	0.0	0.0	0.0	0.0	1.0000000
DAIRY INDUSTRY	16	0.0	0.0	0.0	0.0	0.0	0.0
FEEDS MFR IND	17	0.0	0.0	0.0	0.0	0.0	0.0
FLOUR CER BAKERY IND	18	0.0	0.0	0.0	0.0	0.0	0.0
VEGETABLE OIL MILLS	19	0.0	0.0	0.0	0.0	0.0	0.0
SOFT DRINKS MFR IND	20	0.0	0.0	0.0	0.0	0.0	0.0
BEERS & ALC MFR IND	21	0.0	0.0	0.0	0.0	0.0	0.0
OTH FOOD MFR IND	22	0.0	0.0	0.0	0.0	0.0	0.0
RUBBER PROD IND	23	0.0	0.0	0.0	0.0	0.0	0.0
LEATHER PROD IND	24	0.0	0.0	0.0	0.0	0.0	0.0
TEXTILE PROD IND	25	0.0	0.0	0.0	0.0	0.0	0.0
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.0	0.0	0.0	0.0	0.0	0.0
WOOD PROD IND	28	0.0	0.0	0.0	0.0	0.0	0.0
FURNITURE IND	29	0.0	0.0	0.0	0.0	0.0	0.0
PULP & PAPER IND	30	0.0	0.0	0.0	0.0	0.0	0.0
PRINTING & PUBL IND	31	0.0	0.0	0.0	0.0	0.0	0.0
PRIMARY MET IND	32	0.0	0.0	0.0	0.0	0.0	0.0
METAL FAB IND	33	0.0	0.0	0.0	0.0	0.0	0.0
MACHINERY IND	34	0.0	0.0	0.0	0.0	0.0	0.0
TRANSP EQUIP IND	35	0.0	0.0	0.0	0.0	0.0	0.0
ELECTR APPL IND	36	0.0	0.0	0.0	0.0	0.0	0.0
CEMENT MFR IND	37	0.0	0.0	0.0	0.0	0.0	0.0
CONCRETE PROD IND	38	0.0	0.0	0.0	0.0	0.0	0.0
READY MIX MFR IND	39	0.0	0.0	0.0	0.0	0.0	0.0
OTH NON-METAL IND	40	0.0	0.0	0.0	0.0	0.0	0.0
PETROLEUM & COAL IND	41	0.0	0.0	0.0	0.0	0.0	0.0
FERTILIZER MFR IND	42	0.0	0.0	0.0	0.0	0.0	0.0
CHEMICAL & REL IND	43	0.0	0.0	0.0	0.0	0.0	0.0
MISC MFR IND	44	0.0	0.0	0.0	0.0	0.0	0.0
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.0	0.0	0.0	0.0	0.0	0.0
TRANSP SERV IND	47	0.0	0.0	0.0	0.0	0.0	0.0
STORAGE SERV IND	48	0.0	0.0	0.0	0.0	0.0	0.0
COMMUNIC SERV IND	49	0.0	0.0	0.0	0.0	0.0	0.0
ELECTRICAL POWER	50	0.0	0.0	0.0	0.0	0.0	0.0
GAS DISTRIB IND	51	0.0	0.0	0.0	0.0	0.0	0.0
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.0	0.0	0.0	0.0	0.0	0.0
RETAIL TRADE	54	0.0	0.0	0.0	0.0	0.0	0.0
FINANCE	55	0.0	0.0	0.0	0.0	0.0	0.0
REAL ESTATE RENTAL	56	0.0	0.0	0.0	0.0	0.0	0.0
EDUCATION & RELATED	57	0.0	0.0	0.0	0.0	0.0	0.0
HOSPITAL & HEALTH	58	0.0	0.0	0.0	0.0	0.0	0.0
ACCOM & FOOD SERV	59	0.0	0.0	0.0	0.0	0.0	0.0
BUSINESS SERV IND	60	0.0	0.0	0.0	0.0	0.0	0.0
PERSONAL SERV IND	61	0.0	0.0	0.0	0.0	0.0	0.0
SUR		1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000

TABLE C-1 DOMESTIC MARKET SHARE COEFFICIENTS (CONTINUED) PAGE

		DAIRY, PROC 19	FEEDS MFR 20	VEG OIL PROD 21	FLOUR, CER & B 22	SOFT DRINKS 23	BEERS & ALC 24
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.0	0.0	0.0	0.0	0.0	0.0
POULTRY & EGG PRDRS	7	0.0	0.0	0.0	0.0	0.0	0.0
DAIRY PRODUCERS	8	0.0	0.0	0.0	0.0	0.0	0.0
OTH AG PRDRS	9	0.0	0.0	0.0	0.0	0.0	0.0
FORESTRY PRDRS	10	0.0	0.0	0.0	0.0	0.0	0.0
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.0	0.0	0.0	0.0	0.0	0.0
CRUDE OIL & GAS IND	13	0.0	0.0	0.0	0.0	0.0	0.0
OTH MINING IND	14	0.0	0.0	0.0	0.0	0.0	0.0
MEAT PROC IND	15	0.0	0.0	0.0	0.0	0.0	0.0
DAIRY INDUSTRY	16	1.0000000	0.0	0.0	0.0	0.0	0.0
FEEDS MFR IND	17	0.0	1.0000000	0.0	0.0	0.0	0.0
FLOUR CER BAKERY IND	18	0.0	0.0	0.0	1.0000000	0.0	0.0
VEGETABLE OIL MILLS	19	0.0	0.0	1.0000000	0.0	0.0	0.0
SOFT DRINKS MFR IND	20	0.0	0.0	0.0	0.0	1.0000000	0.0
BEERS & ALC MFR IND	21	0.0	0.0	0.0	0.0	0.0	1.0000000
OTH FOOD MFR IND	22	0.0	0.0	0.0	0.0	0.0	0.0
RUBBER PROD IND	23	0.0	0.0	0.0	0.0	0.0	0.0
LEATHER PROD IND	24	0.0	0.0	0.0	0.0	0.0	0.0
TEXTILE PROD IND	25	0.0	0.0	0.0	0.0	0.0	0.0
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.0	0.0	0.0	0.0	0.0	0.0
WOOD PROD IND	28	0.0	0.0	0.0	0.0	0.0	0.0
FURNITURE IND	29	0.0	0.0	0.0	0.0	0.0	0.0
PULP & PAPER IND	30	0.0	0.0	0.0	0.0	0.0	0.0
PRINTING & PUBL IND	31	0.0	0.0	0.0	0.0	0.0	0.0
PRIMARY MET IND	32	0.0	0.0	0.0	0.0	0.0	0.0
METAL FAB IND	33	0.0	0.0	0.0	0.0	0.0	0.0
MACHINERY IND	34	0.0	0.0	0.0	0.0	0.0	0.0
TRANSP EQUIP IND	35	0.0	0.0	0.0	0.0	0.0	0.0
ELECTR APPL IND	36	0.0	0.0	0.0	0.0	0.0	0.0
CEMENT MFR IND	37	0.0	0.0	0.0	0.0	0.0	0.0
CONCRETE PROD IND	38	0.0	0.0	0.0	0.0	0.0	0.0
READY MIX MFR IND	39	0.0	0.0	0.0	0.0	0.0	0.0
OTH NON-METAL IND	40	0.0	0.0	0.0	0.0	0.0	0.0
PETROLEUM & COAL IND	41	0.0	0.0	0.0	0.0	0.0	0.0
FERTILIZER MFR IND	42	0.0	0.0	0.0	0.0	0.0	0.0
CHEMICAL & REL IND	43	0.0	0.0	0.0	0.0	0.0	0.0
MISC MFR IND	44	0.0	0.0	0.0	0.0	0.0	0.0
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.0	0.0	0.0	0.0	0.0	0.0
TRANSP SERV IND	47	0.0	0.0	0.0	0.0	0.0	0.0
STORAGE SERV IND	48	0.0	0.0	0.0	0.0	0.0	0.0
COMMUNIC SERV IND	49	0.0	0.0	0.0	0.0	0.0	0.0
ELECTRICAL POWER	50	0.0	0.0	0.0	0.0	0.0	0.0
GAS DISTRIB IND	51	0.0	0.0	0.0	0.0	0.0	0.0
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.0	0.0	0.0	0.0	0.0	0.0
RETAIL TRADE	54	0.0	0.0	0.0	0.0	0.0	0.0
FINANCE	55	0.0	0.0	0.0	0.0	0.0	0.0
REAL ESTATE RENTAL	56	0.0	0.0	0.0	0.0	0.0	0.0
EDUCATION & RELATED	57	0.0	0.0	0.0	0.0	0.0	0.0
HOSPITAL & HEALTH	58	0.0	0.0	0.0	0.0	0.0	0.0
ACCOM & FOOD SERV	59	0.0	0.0	0.0	0.0	0.0	0.0
BUSINESS SERV IND	60	0.0	0.0	0.0	0.0	0.0	0.0
PERSONAL SERV IND	61	0.0	0.0	0.0	0.0	0.0	0.0
SUM		1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000

TABLE C-1 DOMESTIC MARKET SHARE COEFFICIENTS (CONTINUED)

		OTH FOODS, NES 25	TIRES & TUBES 26	OTH RUBBER PROD 27	LEATHER PROD 28	TEXTILE PROD 29	HOSIERY & KNITTED 30
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.0	0.0	0.0	0.0	0.0	0.0
POULTRY & EGG PRDRS	7	0.0	0.0	0.0	0.0	0.0	0.0
DAIRY PRODUCERS	8	0.0	0.0	0.0	0.0	0.0	0.0
OTH AG PRDRS	9	0.0	0.0	0.0	0.0	0.0	0.0
FORESTRY PRDRS	10	0.0	0.0	0.0	0.0	0.0	0.0
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.0	0.0	0.0	0.0	0.0	0.0
CRUDE OIL & GAS IND	13	0.0	0.0	0.0	0.0	0.0	0.0
OTH MINING IND	14	0.0	0.0	0.0	0.0	0.0	0.0
MEAT PROC IND	15	0.0	0.0	0.0	0.0	0.0	0.0
DAIRY INDUSTRY	16	0.0	0.0	0.0	0.0	0.0	0.0
FEEDS MFR IND	17	0.0	0.0	0.0	0.0	0.0	0.0
FLOUR CER BAKERY IND	18	0.0	0.0	0.0	0.0	0.0	0.0
VEGETABLE OIL MILLS	19	0.0	0.0	0.0	0.0	0.0	0.0
SOFT DRINKS MFR IND	20	0.0	0.0	0.0	0.0	0.0	0.0
BEERS & ALC MFR IND	21	0.0	0.0	0.0	0.0	0.0	0.0
OTH FOOD MFR IND	22	1.0000000	0.0	0.0	0.0	0.0	0.0
RUBBER PROD IND	23	0.0	1.0000000	1.0000000	0.0	0.0	0.0
LEATHER PROD IND	24	0.0	0.0	0.0	1.0000000	0.0	0.0
TEXTILE PROD IND	25	0.0	0.0	0.0	0.0	1.0000000	0.0
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	1.0000000
CLOTHING IND	27	0.0	0.0	0.0	0.0	0.0	0.0
WOOD PROD IND	28	0.0	0.0	0.0	0.0	0.0	0.0
FURNITURE IND	29	0.0	0.0	0.0	0.0	0.0	0.0
PULP & PAPER IND	30	0.0	0.0	0.0	0.0	0.0	0.0
PRINTING & PUBL IND	31	0.0	0.0	0.0	0.0	0.0	0.0
PRIMARY MET IND	32	0.0	0.0	0.0	0.0	0.0	0.0
METAL FAB IND	33	0.0	0.0	0.0	0.0	0.0	0.0
MACHINERY IND	34	0.0	0.0	0.0	0.0	0.0	0.0
TRANSP EQUIP IND	35	0.0	0.0	0.0	0.0	0.0	0.0
ELECTR APPL IND	36	0.0	0.0	0.0	0.0	0.0	0.0
CEMENT MFR IND	37	0.0	0.0	0.0	0.0	0.0	0.0
CONCRETE PROD IND	38	0.0	0.0	0.0	0.0	0.0	0.0
READY MIX MFR IND	39	0.0	0.0	0.0	0.0	0.0	0.0
OTH NON-METAL IND	40	0.0	0.0	0.0	0.0	0.0	0.0
PETROLEUM & COAL IND	41	0.0	0.0	0.0	0.0	0.0	0.0
FERTILIZER MFR IND	42	0.0	0.0	0.0	0.0	0.0	0.0
CHEMICAL & REL IND	43	0.0	0.0	0.0	0.0	0.0	0.0
MISC MFR IND	44	0.0	0.0	0.0	0.0	0.0	0.0
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.0	0.0	0.0	0.0	0.0	0.0
TRANSP SERV IND	47	0.0	0.0	0.0	0.0	0.0	0.0
STORAGE SERV IND	48	0.0	0.0	0.0	0.0	0.0	0.0
COMMUNIC SERV IND	49	0.0	0.0	0.0	0.0	0.0	0.0
ELECTRICAL POWER	50	0.0	0.0	0.0	0.0	0.0	0.0
GAS DISTRIB IND	51	0.0	0.0	0.0	0.0	0.0	0.0
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.0	0.0	0.0	0.0	0.0	0.0
RETAIL TRADE	54	0.0	0.0	0.0	0.0	0.0	0.0
FINANCE	55	0.0	0.0	0.0	0.0	0.0	0.0
REAL ESTATE RENTAL	56	0.0	0.0	0.0	0.0	0.0	0.0
EDUCATION & RELATED	57	0.0	0.0	0.0	0.0	0.0	0.0
HOSPITAL & HEALTH	58	0.0	0.0	0.0	0.0	0.0	0.0
ACCOM & FOOD SERV	59	0.0	0.0	0.0	0.0	0.0	0.0
BUSINESS SERV IND	60	0.0	0.0	0.0	0.0	0.0	0.0
PERSONAL SERV IND	61	0.0	0.0	0.0	0.0	0.0	0.0
SUM		1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000

TABLE C-1 DOMESTIC MARKET SHARE COEFFICIENTS (CONTINUED)

		CLOTHING 31	LUMBER & PLYWOOD 32	WOOD PROD NES 33	FURNIT & FIX 34	PULP & PAPER 35	PRINTING & PUB 36
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.0	0.0	0.0	0.0	0.0	0.0
POULTRY & EGG PRDRS	7	0.0	0.0	0.0	0.0	0.0	0.0
DAIRY PRODUCERS	8	0.0	0.0	0.0	0.0	0.0	0.0
OTH AG PRDRS	9	0.0	0.0	0.0	0.0	0.0	0.0
FORESTRY PRDRS	10	0.0	0.0	0.0	0.0	0.0	0.0
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.0	0.0	0.0	0.0	0.0	0.0
CRUDE OIL & GAS IND	13	0.0	0.0	0.0	0.0	0.0	0.0
OTH MINING IND	14	0.0	0.0	0.0	0.0	0.0	0.0
MEAT PROC IND	15	0.0	0.0	0.0	0.0	0.0	0.0
DAIRY INDUSTRY	16	0.0	0.0	0.0	0.0	0.0	0.0
FEEDS MFR IND	17	0.0	0.0	0.0	0.0	0.0	0.0
FLOUR CER BAKERY IND	18	0.0	0.0	0.0	0.0	0.0	0.0
VEGETABLE OIL MILLS	19	0.0	0.0	0.0	0.0	0.0	0.0
SOFT DRINKS MFR IND	20	0.0	0.0	0.0	0.0	0.0	0.0
BEERS & ALC MFR IND	21	0.0	0.0	0.0	0.0	0.0	0.0
OTH FOOD MFR IND	22	0.0	0.0	0.0	0.0	0.0	0.0
RUBBER PROD IND	23	0.0	0.0	0.0	0.0	0.0	0.0
LEATHER PROD IND	24	0.0	0.0	0.0	0.0	0.0	0.0
TEXTILE PROD IND	25	0.0	0.0	0.0	0.0	0.0	0.0
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	1.0000000	0.0	0.0	0.0	0.0	0.0
WOOD PROD IND	28	0.0	1.0000000	1.0000000	0.0	0.0	0.0
FURNITURE IND	29	0.0	0.0	0.0	1.0000000	0.0	0.0
PULP & PAPER IND	30	0.0	0.0	0.0	0.0	1.0000000	0.0
PRINTING & PUBL IND	31	0.0	0.0	0.0	0.0	0.0	1.0000000
PRIMARY MET IND	32	0.0	0.0	0.0	0.0	0.0	0.0
METAL FAB IND	33	0.0	0.0	0.0	0.0	0.0	0.0
MACHINERY IND	34	0.0	0.0	0.0	0.0	0.0	0.0
TRANSP EQUIP IND	35	0.0	0.0	0.0	0.0	0.0	0.0
ELECTR APPL IND	36	0.0	0.0	0.0	0.0	0.0	0.0
CEMENT MFR IND	37	0.0	0.0	0.0	0.0	0.0	0.0
CONCRETE PROD IND	38	0.0	0.0	0.0	0.0	0.0	0.0
READY MIX MFR IND	39	0.0	0.0	0.0	0.0	0.0	0.0
OTH NON-METAL IND	40	0.0	0.0	0.0	0.0	0.0	0.0
PETROLEUM & COAL IND	41	0.0	0.0	0.0	0.0	0.0	0.0
FERTILIZER MFR IND	42	0.0	0.0	0.0	0.0	0.0	0.0
CHEMICAL & REL IND	43	0.0	0.0	0.0	0.0	0.0	0.0
MISC MFR IND	44	0.0	0.0	0.0	0.0	0.0	0.0
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.0	0.0	0.0	0.0	0.0	0.0
TRANSP SERV IND	47	0.0	0.0	0.0	0.0	0.0	0.0
STORAGE SERV IND	48	0.0	0.0	0.0	0.0	0.0	0.0
COMMUNIC SERV IND	49	0.0	0.0	0.0	0.0	0.0	0.0
ELECTRICAL POWER	50	0.0	0.0	0.0	0.0	0.0	0.0
GAS DISTRIB IND	51	0.0	0.0	0.0	0.0	0.0	0.0
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.0	0.0	0.0	0.0	0.0	0.0
RETAIL TRADE	54	0.0	0.0	0.0	0.0	0.0	0.0
FINANCE	55	0.0	0.0	0.0	0.0	0.0	0.0
REAL ESTATE RENTAL	56	0.0	0.0	0.0	0.0	0.0	0.0
EDUCATION & RELATED	57	0.0	0.0	0.0	0.0	0.0	0.0
HOSPITAL & HEALTH	58	0.0	0.0	0.0	0.0	0.0	0.0
ACCOM & FOOD SERV	59	0.0	0.0	0.0	0.0	0.0	0.0
BUSINESS SERV IND	60	0.0	0.0	0.0	0.0	0.0	0.0
PERSONAL SERV IND	61	0.0	0.0	0.0	0.0	0.0	0.0
SUM		1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000

TABLE C-1 DOMESTIC MARKET SHARE COEFFICIENTS (CONTINUED)

		IRON & STEEL 37	OTH PRIM METAL 38	METAL FAB PROD 39	MACHINERY 40	VEHICLES & OTH TRANS 41	ELECT APPLIANCES 42
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDPS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.0	0.0	0.0	0.0	0.0	0.0
POULTRY & EGG PRDRS	7	0.0	0.0	0.0	0.0	0.0	0.0
DAIRY PRODUCERS	8	0.0	0.0	0.0	0.0	0.0	0.0
OTH AG PRDRS	9	0.0	0.0	0.0	0.0	0.0	0.0
FORESTRY PRDRS	10	0.0	0.0	0.0	0.0	0.0	0.0
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.0	0.0	0.0	0.0	0.0	0.0
CRUDE OIL & GAS IND	13	0.0	0.0	0.0	0.0	0.0	0.0
OTH MINING IND	14	0.0	0.0	0.0	0.0	0.0	0.0
MEAT PROC IND	15	0.0	0.0	0.0	0.0	0.0	0.0
DAIRY INDUSTRY	16	0.0	0.0	0.0	0.0	0.0	0.0
FEEDS MFR IND	17	0.0	0.0	0.0	0.0	0.0	0.0
FLOUR CER BAKERY IND	18	0.0	0.0	0.0	0.0	0.0	0.0
VEGETABLE OIL MILLS	19	0.0	0.0	0.0	0.0	0.0	0.0
SOFT DRINKS MFR IND	20	0.0	0.0	0.0	0.0	0.0	0.0
BEERS & ALC MFR IND	21	0.0	0.0	0.0	0.0	0.0	0.0
OTH FOOD MFR IND	22	0.0	0.0	0.0	0.0	0.0	0.0
RUBBER PROD IND	23	0.0	0.0	0.0	0.0	0.0	0.0
LEATHER PROD IND	24	0.0	0.0	0.0	0.0	0.0	0.0
TEXTILE PROD IND	25	0.0	0.0	0.0	0.0	0.0	0.0
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.0	0.0	0.0	0.0	0.0	0.0
WOOD PROD IND	28	0.0	0.0	0.0	0.0	0.0	0.0
FURNITURE IND	29	0.0	0.0	0.0	0.0	0.0	0.0
PULP & PAPER IND	30	0.0	0.0	0.0	0.0	0.0	0.0
PRINTING & PUBL IND	31	0.0	0.0	0.0	0.0	0.0	0.0
PRIMARY MET IND	32	1.0000000	1.0000000	0.0	0.0	0.0	0.0
METAL FAB IND	33	0.0	0.0	1.0000000	0.0	0.0	0.0
MACHINERY IND	34	0.0	0.0	0.0	1.0000000	0.0	0.0
TRANSP EQUIP IND	35	0.0	0.0	0.0	0.0	1.0000000	0.0
ELECTR APPL IND	36	0.0	0.0	0.0	0.0	0.0	1.0000000
CEMENT MFR IND	37	0.0	0.0	0.0	0.0	0.0	0.0
CONCRETE PROD IND	38	0.0	0.0	0.0	0.0	0.0	0.0
READY MIX MFR IND	39	0.0	0.0	0.0	0.0	0.0	0.0
OTH NON-METAL IND	40	0.0	0.0	0.0	0.0	0.0	0.0
PETROLEUM & COAL IND	41	0.0	0.0	0.0	0.0	0.0	0.0
FERTILIZER MFR IND	42	0.0	0.0	0.0	0.0	0.0	0.0
CHEMICAL & REL IND	43	0.0	0.0	0.0	0.0	0.0	0.0
MISC MFR IND	44	0.0	0.0	0.0	0.0	0.0	0.0
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.0	0.0	0.0	0.0	0.0	0.0
TRANSP SERV IND	47	0.0	0.0	0.0	0.0	0.0	0.0
STORAGE SERV IND	48	0.0	0.0	0.0	0.0	0.0	0.0
COMMUNIC SERV IND	49	0.0	0.0	0.0	0.0	0.0	0.0
ELECTRICAL POWER	50	0.0	0.0	0.0	0.0	0.0	0.0
GAS DISTRIB IND	51	0.0	0.0	0.0	0.0	0.0	0.0
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.0	0.0	0.0	0.0	0.0	0.0
RETAIL TRADE	54	0.0	0.0	0.0	0.0	0.0	0.0
FINANCE	55	0.0	0.0	0.0	0.0	0.0	0.0
REAL ESTATE RENTAL	56	0.0	0.0	0.0	0.0	0.0	0.0
EDUCATION & RELATED	57	0.0	0.0	0.0	0.0	0.0	0.0
HOSPITAL & HEALTH	58	0.0	0.0	0.0	0.0	0.0	0.0
ACCOM & FOOD SERV	59	0.0	0.0	0.0	0.0	0.0	0.0
BUSINESS SERV IND	60	0.0	0.0	0.0	0.0	0.0	0.0
PERSONAL SERV IND	61	0.0	0.0	0.0	0.0	0.0	0.0
SUM		1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000

TABLE C-1 DOMESTIC MARKET SHARE COEFFICIENTS (CONTINUED) PAGE

		CEMENT 43	OTH NON-MET 44	PETROLEUM 45	FERTILIZER 46	CHEMICAL 47	MISC MFR 48
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.0	0.0	0.0	0.0	0.0	0.0
POULTRY & EGG PRDRS	7	0.0	0.0	0.0	0.0	0.0	0.0
DAIRY PRODUCERS	8	0.0	0.0	0.0	0.0	0.0	0.0
OTH AG PRDRS	9	0.0	0.0	0.0	0.0	0.0	0.0
FORESTRY PRDRS	10	0.0	0.0	0.0	0.0	0.0	0.0
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.0	0.0	0.0	0.0	0.0	0.0
CRUDE OIL & GAS IND	13	0.0	0.0	0.0	0.0	0.0	0.0
OTH MINING IND	14	0.0	0.0	0.0	0.0	0.0	0.0
MEAT PROC IND	15	0.0	0.0	0.0	0.0	0.0	0.0
DAIRY INDUSTRY	16	0.0	0.0	0.0	0.0	0.0	0.0
FEEDS MFR IND	17	0.0	0.0	0.0	0.0	0.0	0.0
FLOUR CER BAKERY IND	18	0.0	0.0	0.0	0.0	0.0	0.0
VEGETABLE OIL MILLS	19	0.0	0.0	0.0	0.0	0.0	0.0
SOFT DRINKS MFR IND	20	0.0	0.0	0.0	0.0	0.0	0.0
BEERS & ALC MFR IND	21	0.0	0.0	0.0	0.0	0.0	0.0
OTH FOOD MFR IND	22	0.0	0.0	0.0	0.0	0.0	0.0
PURPIS PROD IND	23	0.0	0.0	0.0	0.0	0.0	0.0
LEATHER PROD IND	24	0.0	0.0	0.0	0.0	0.0	0.0
TEXTILE PROD IND	25	0.0	0.0	0.0	0.0	0.0	0.0
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.0	0.0	0.0	0.0	0.0	0.0
WOOD PROD IND	28	0.0	0.0	0.0	0.0	0.0	0.0
FURNITURE IND	29	0.0	0.0	0.0	0.0	0.0	0.0
PULP & PAPER IND	30	0.0	0.0	0.0	0.0	0.0	0.0
PRINTING & PUBL IND	31	0.0	0.0	0.0	0.0	0.0	0.0
PRIMARY MET IND	32	0.0	0.0	0.0	0.0	0.0	0.0
METAL FAB IND	33	0.0	0.0	0.0	0.0	0.0	0.0
MACHINERY IND	34	0.0	0.0	0.0	0.0	0.0	0.0
TRANSP EQUIP IND	35	0.0	0.0	0.0	0.0	0.0	0.0
ELECTR APPL IND	36	0.0	0.0	0.0	0.0	0.0	0.0
CEMENT MFR IND	37	1.0000000	0.0	0.0	0.0	0.0	0.0
CONCRETE PROD IND	38	0.0	0.3906328	0.0	0.0	0.0	0.0
READY MIX MFR IND	39	0.0	0.3435989	0.0	0.0	0.0	0.0
OTH NON-METAL IND	40	0.0	0.2657681	0.0	0.0	0.0	0.0
PETROLEUM & COAL IND	41	0.0	0.0	1.0000000	0.0	0.0	0.0
FERTILIZER MFR IND	42	0.0	0.0	0.0	1.0000000	0.0	0.0
CHEMICAL & REL IND	43	0.0	0.0	0.0	0.0	1.0000000	0.0
MISC MFR IND	44	0.0	0.0	0.0	0.0	0.0	1.0000000
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.0	0.0	0.0	0.0	0.0	0.0
TRANSP SERV IND	47	0.0	0.0	0.0	0.0	0.0	0.0
STORAGE SERV IND	48	0.0	0.0	0.0	0.0	0.0	0.0
COMMUNIC SERV IND	49	0.0	0.0	0.0	0.0	0.0	0.0
ELECTRICAL POWER	50	0.0	0.0	0.0	0.0	0.0	0.0
GAS DISTRIB IND	51	0.0	0.0	0.0	0.0	0.0	0.0
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.0	0.0	0.0	0.0	0.0	0.0
RETAIL TRADE	54	0.0	0.0	0.0	0.0	0.0	0.0
FINANCE	55	0.0	0.0	0.0	0.0	0.0	0.0
REAL ESTATE RENTAL	56	0.0	0.0	0.0	0.0	0.0	0.0
EDUCATION & RELATED	57	0.0	0.0	0.0	0.0	0.0	0.0
HOSPITAL & HEALTH	58	0.0	0.0	0.0	0.0	0.0	0.0
ACCOM & FOOD SERV	59	0.0	0.0	0.0	0.0	0.0	0.0
BUSINESS SERV IND	60	0.0	0.0	0.0	0.0	0.0	0.0
PERSONAL SERV IND	61	0.0	0.0	0.0	0.0	0.0	0.0
SUM		1.0000000	0.9999998	1.0000000	1.0000000	1.0000000	1.0000000

TABLE C-1 DOMESTIC MARKET SHARE COEFFICIENTS (CONTINUED)

PAGE

		NEW CONSTRUCT 49	REPAIR CONSTRUCT 50	TRANSP SERV 51	STORAGE SERV 52	COMMUNIC 53	ELECT POWER 54
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.0	0.0	0.0	0.0	0.0	0.0
POULTRY & EGG PRDRS	7	0.0	0.0	0.0	0.0	0.0	0.0
DAIRY PRODUCERS	8	0.0	0.0	0.0	0.0	0.0	0.0
OTH AG PRDRS	9	0.0	0.0	0.0	0.0	0.0	0.0
FORESTRY PRDRS	10	0.0	0.0	0.0	0.0	0.0	0.0
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.0	0.0	0.0	0.0	0.0	0.0
CRUDE OIL & GAS IND	13	0.0	0.0	0.0	0.0	0.0	0.0
OTH MINING IND	14	0.0	0.0	0.0	0.0	0.0	0.0
MEAT PROC IND	15	0.0	0.0	0.0	0.0	0.0	0.0
DAIRY INDUSTRY	16	0.0	0.0	0.0	0.0	0.0	0.0
FEEDS MFR IND	17	0.0	0.0	0.0	0.0	0.0	0.0
FLOUR CER BAKERY IND	18	0.0	0.0	0.0	0.0	0.0	0.0
VEGETABLE OIL MILLS	19	0.0	0.0	0.0	0.0	0.0	0.0
SOFT DRINKS MFR IND	20	0.0	0.0	0.0	0.0	0.0	0.0
BEERS & ALC MFR IND	21	0.0	0.0	0.0	0.0	0.0	0.0
OTH FOOD MFR IND	22	0.0	0.0	0.0	0.0	0.0	0.0
RUBBER PROD IND	23	0.0	0.0	0.0	0.0	0.0	0.0
LEATHER PROD IND	24	0.0	0.0	0.0	0.0	0.0	0.0
TEXTILE PROD IND	25	0.0	0.0	0.0	0.0	0.0	0.0
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.0	0.0	0.0	0.0	0.0	0.0
WOOD PROD IND	28	0.0	0.0	0.0	0.0	0.0	0.0
FURNITURE IND	29	0.0	0.0	0.0	0.0	0.0	0.0
PULP & PAPER IND	30	0.0	0.0	0.0	0.0	0.0	0.0
PRINTING & PUBL IND	31	0.0	0.0	0.0	0.0	0.0	0.0
PRIMARY MET IND	32	0.0	0.0	0.0	0.0	0.0	0.0
METAL FAB IND	33	0.0	0.0	0.0	0.0	0.0	0.0
MACHINERY IND	34	0.0	0.0	0.0	0.0	0.0	0.0
TRANSP EQUIP IND	35	0.0	0.0	0.0	0.0	0.0	0.0
ELECTR APPL IND	36	0.0	0.0	0.0	0.0	0.0	0.0
CEMENT MFR IND	37	0.0	0.0	0.0	0.0	0.0	0.0
CONCRETE PROD IND	38	0.0	0.0	0.0	0.0	0.0	0.0
READY MIX MFR IND	39	0.0	0.0	0.0	0.0	0.0	0.0
OTH NON-METAL IND	40	0.0	0.0	0.0	0.0	0.0	0.0
PETROLEUM & COAL IND	41	0.0	0.0	0.0	0.0	0.0	0.0
FERTILIZER MFR IND	42	0.0	0.0	0.0	0.0	0.0	0.0
CHEMICAL & REL IND	43	0.0	0.0	0.0	0.0	0.0	0.0
MISC MFR IND	44	0.0	0.0	0.0	0.0	0.0	0.0
NEW CONSTR IND	45	1.0000000	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.0	1.0000000	0.0	0.0	0.0	0.0
TRANSP SERV IND	47	0.0	0.0	1.0000000	0.0	0.0	0.0
STORAGE SERV IND	48	0.0	0.0	0.0	1.0000000	0.0	0.0
COMMUNIC SERV IND	49	0.0	0.0	0.0	0.0	1.0000000	0.0
ELECTRICAL POWER	50	0.0	0.0	0.0	0.0	0.0	1.0000000
GAS DISTRIB IND	51	0.0	0.0	0.0	0.0	0.0	0.0
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.0	0.0	0.0	0.0	0.0	0.0
RETAIL TRADE	54	0.0	0.0	0.0	0.0	0.0	0.0
FINANCE	55	0.0	0.0	0.0	0.0	0.0	0.0
REAL ESTATE RENTAL	56	0.0	0.0	0.0	0.0	0.0	0.0
EDUCATION & RELATED	57	0.0	0.0	0.0	0.0	0.0	0.0
HOSPITAL & HEALTH	58	0.0	0.0	0.0	0.0	0.0	0.0
ACCOM & FOOD SERV	59	0.0	0.0	0.0	0.0	0.0	0.0
BUSINESS SERV IND	60	0.0	0.0	0.0	0.0	0.0	0.0
PERSONAL SERV IND	61	0.0	0.0	0.0	0.0	0.0	0.0
SUM		1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000

TABLE C-1 DOMESTIC MARKET SHARE COEFFICIENTS (CONTINUED)

PAGE

		GAS PIPE SERV 55	WATER & OTH 56	WHOLESALE 57	RETAIL 58	FINANCE & OTH 59	REAL ESTATE 60
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.0	0.0	0.0	0.0	0.0	0.0
POULTRY & EGG PRDRS	7	0.0	0.0	0.0	0.0	0.0	0.0
DAIRY PRODUCERS	8	0.0	0.0	0.0	0.0	0.0	0.0
OTH AG PRDRS	9	0.0	0.0	0.0	0.0	0.0	0.0
FORESTRY PRDRS	10	0.0	0.0	0.0	0.0	0.0	0.0
FISHING, H & T PRDPS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.0	0.0	0.0	0.0	0.0	0.0
CRUDE OIL & GAS IND	13	0.0	0.0	0.0	0.0	0.0	0.0
OTH MINING IND	14	0.0	0.0	0.0	0.0	0.0	0.0
MEAT PROC IND	15	0.0	0.0	0.0	0.0	0.0	0.0
DAIRY INDUSTRY	16	0.0	0.0	0.0	0.0	0.0	0.0
FEEDS MFR IND	17	0.0	0.0	0.0	0.0	0.0	0.0
FLOUR CER BAKERY IND	18	0.0	0.0	0.0	0.0	0.0	0.0
VEGETABLE OIL MILLS	19	0.0	0.0	0.0	0.0	0.0	0.0
SOFT DRINKS MFR IND	20	0.0	0.0	0.0	0.0	0.0	0.0
BEERS & ALC MFR IND	21	0.0	0.0	0.0	0.0	0.0	0.0
OTH FOOD MFR IND	22	0.0	0.0	0.0	0.0	0.0	0.0
RUBBER PROD IND	23	0.0	0.0	0.0	0.0	0.0	0.0
LEATHER PROD IND	24	0.0	0.0	0.0	0.0	0.0	0.0
TEXTILE PROD IND	25	0.0	0.0	0.0	0.0	0.0	0.0
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.0	0.0	0.0	0.0	0.0	0.0
WOOD PROD IND	28	0.0	0.0	0.0	0.0	0.0	0.0
FURNITURE IND	29	0.0	0.0	0.0	0.0	0.0	0.0
PULP & PAPER IND	30	0.0	0.0	0.0	0.0	0.0	0.0
PRINTING & PUBL IND	31	0.0	0.0	0.0	0.0	0.0	0.0
PRIMARY MET IND	32	0.0	0.0	0.0	0.0	0.0	0.0
METAL FAB IND	33	0.0	0.0	0.0	0.0	0.0	0.0
MACHINERY IND	34	0.0	0.0	0.0	0.0	0.0	0.0
TRANSP EQUIP IND	35	0.0	0.0	0.0	0.0	0.0	0.0
ELECTR APPL IND	36	0.0	0.0	0.0	0.0	0.0	0.0
CEMENT MFR IND	37	0.0	0.0	0.0	0.0	0.0	0.0
CONCRETE PROD IND	38	0.0	0.0	0.0	0.0	0.0	0.0
READY MIX MFR IND	39	0.0	0.0	0.0	0.0	0.0	0.0
OTH NON-METAL IND	40	0.0	0.0	0.0	0.0	0.0	0.0
PETROLEUM & COAL IND	41	0.0	0.0	0.0	0.0	0.0	0.0
FERTILIZER MFR IND	42	0.0	0.0	0.0	0.0	0.0	0.0
CHEMICAL & REL IND	43	0.0	0.0	0.0	0.0	0.0	0.0
MISC MFR IND	44	0.0	0.0	0.0	0.0	0.0	0.0
RES CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.0	0.0	0.0	0.0	0.0	0.0
TRANSP SERV IND	47	0.0	0.0	0.0	0.0	0.0	0.0
STORAGE SERV IND	48	0.0	0.0	0.0	0.0	0.0	0.0
COMMUNIC SERV IND	49	0.0	0.0	0.0	0.0	0.0	0.0
ELECTRICAL POWER	50	0.0	0.0	0.0	0.0	0.0	0.0
GAS DISTRIB IND	51	1.0000000	0.0	0.0	0.0	0.0	0.0
WATER & OTH IND	52	0.0	1.0000000	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.0	0.0	1.0000000	0.0	0.0	0.0
RETAIL TRADE	54	0.0	0.0	0.0	1.0000000	0.0	0.0
FINANCE	55	0.0	0.0	0.0	0.0	1.0000000	0.0
REAL ESTATE RENTAL	56	0.0	0.0	0.0	0.0	0.0	1.0000000
EDUCATION & RELATED	57	0.0	0.0	0.0	0.0	0.0	0.0
HOSPITAL & HEALTH	58	0.0	0.0	0.0	0.0	0.0	0.0
ACCOM & FOOD SERV	59	0.0	0.0	0.0	0.0	0.0	0.0
BUSINESS SERV IND	60	0.0	0.0	0.0	0.0	0.0	0.0
PERSONAL SERV IND	61	0.0	0.0	0.0	0.0	0.0	0.0
SUM		1.0000000	1.0000000	1.0000000	1.0000000	1.0000000	1.0000000

TABLE C-1 DOMESTIC MARKET SHARE COEFFICIENTS (CONTINUED)

		EDUCATION 61	HEALTH SERV 62	ACCOM & FOOD 63	BUSINESS SERV 64	PERSONAL SERV 65
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.0	0.0	0.0	0.0	0.0
POULTRY & EGG PRDRS	7	0.0	0.0	0.0	0.0	0.0
DAIRY PRODUCERS	8	0.0	0.0	0.0	0.0	0.0
OTH AG PRDRS	9	0.0	0.0	0.0	0.0	0.0
FORESTRY PRDRS	10	0.0	0.0	0.0	0.0	0.0
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.0	0.0	0.0	0.0	0.0
CRUDE OIL & GAS IND	13	0.0	0.0	0.0	0.0	0.0
OTH MINING IND	14	0.0	0.0	0.0	0.0	0.0
MEAT PROC IND	15	0.0	0.0	0.0	0.0	0.0
DAIRY INDUSTRY	16	0.0	0.0	0.0	0.0	0.0
FEEDS MFR IND	17	0.0	0.0	0.0	0.0	0.0
FLOUR CER BAKERY IND	18	0.0	0.0	0.0	0.0	0.0
VEGETABLE OIL MILLS	19	0.0	0.0	0.0	0.0	0.0
SOFT DRINKS MFR IND	20	0.0	0.0	0.0	0.0	0.0
BEERS & ALC MFR IND	21	0.0	0.0	0.0	0.0	0.0
OTH FOOD MFR IND	22	0.0	0.0	0.0	0.0	0.0
RUBBER PROD IND	23	0.0	0.0	0.0	0.0	0.0
LEATHER PROD IND	24	0.0	0.0	0.0	0.0	0.0
TEXTILE PROD IND	25	0.0	0.0	0.0	0.0	0.0
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.0	0.0	0.0	0.0	0.0
WOOD PROD IND	28	0.0	0.0	0.0	0.0	0.0
FURNITURE IND	29	0.0	0.0	0.0	0.0	0.0
PULP & PAPER IND	30	0.0	0.0	0.0	0.0	0.0
PRINTING & PUBL IND	31	0.0	0.0	0.0	0.0	0.0
PRIMARY MET IND	32	0.0	0.0	0.0	0.0	0.0
METAL FAB IND	33	0.0	0.0	0.0	0.0	0.0
MACHINERY IND	34	0.0	0.0	0.0	0.0	0.0
TRANSP EQUIP IND	35	0.0	0.0	0.0	0.0	0.0
ELECTR APPL IND	36	0.0	0.0	0.0	0.0	0.0
CEMENT MFR IND	37	0.0	0.0	0.0	0.0	0.0
CONCRETE PROD IND	38	0.0	0.0	0.0	0.0	0.0
READY MIX MFR IND	39	0.0	0.0	0.0	0.0	0.0
OTH NON-METAL IND	40	0.0	0.0	0.0	0.0	0.0
PETROLEUM & COAL IND	41	0.0	0.0	0.0	0.0	0.0
FERTILIZER MFR IND	42	0.0	0.0	0.0	0.0	0.0
CHEMICAL & REL IND	43	0.0	0.0	0.0	0.0	0.0
MISC MFR IND	44	0.0	0.0	0.0	0.0	0.0
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.0	0.0	0.0	0.0	0.0
TRANSP SERV IND	47	0.0	0.0	0.0	0.0	0.0
STORAGE SERV IND	48	0.0	0.0	0.0	0.0	0.0
COMMUNIC SERV IND	49	0.0	0.0	0.0	0.0	0.0
ELECTRICAL POWER	50	0.0	0.0	0.0	0.0	0.0
GAS DISTRIB IND	51	0.0	0.0	0.0	0.0	0.0
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.0	0.0	0.0	0.0	0.0
RETAIL TRADE	54	0.0	0.0	0.0	0.0	0.0
FINANCE	55	0.0	0.0	0.0	0.0	0.0
REAL ESTATE RENTAL	56	0.0	0.0	0.0	0.0	0.0
EDUCATION & RELATED	57	1.0000000	0.0	0.0	0.0	0.0
HOSPITAL & HEALTH	58	0.0	1.0000000	0.0	0.0	0.0
ACCOM & FOOD SERV	59	0.0	0.0	1.0000000	0.0	0.0
BUSINESS SERV IND	60	0.0	0.0	0.0	1.0000000	0.0
PERSONAL SERV IND	61	0.0	0.0	0.0	0.0	1.0000000
SUM		1.0000000	1.0000000	1.0000000	1.0000000	1.0000000

TABLE C-2 DOMESTIC MARKET SHARE MATRIX
(IN THOUSANDS OF 1972 DOLLARS)

PAGE

		WHEAT, UNMILLED	BARLEY, UNMILLED	OIL SEEDS	OTH CEREAL CROPS	HAY, FORAGE	LIVESTOCK
		1	2	3	4	5	6
WHEAT PRODUCERS	1	65886.	0.	0.	0.	452.	0.
BARLEY PRODUCERS	2	0.	98607.	0.	0.	439.	0.
OIL SEEDS PRDRS	3	0.	0.	24555.	0.	0.	0.
OTH GRAIN PRDRS	4	0.	0.	0.	64178.	581.	0.
FORAGE PRDRS	5	0.	0.	0.	462.	47250.	0.
LIVESTOCK PRDRS	6	0.	0.	0.	0.	0.	133438.
POULTRY & EGG PRDRS	7	0.	0.	0.	0.	0.	0.
DAIRY PRODUCERS	8	0.	0.	0.	0.	0.	2046.
OTH AG PRDRS	9	0.	0.	0.	0.	0.	0.
FORESTRY PRDRS	10	0.	0.	0.	0.	0.	0.
FISHING, H & T PRDRS	11	0.	0.	0.	0.	0.	0.
COAL MINING IND	12	0.	0.	0.	0.	0.	0.
CRUDE OIL & GAS IND	13	0.	0.	0.	0.	0.	0.
OTH MINING IND	14	0.	0.	0.	0.	0.	0.
MEAT PROC IND	15	0.	0.	0.	0.	0.	0.
DAIRY INDUSTRY	16	0.	0.	0.	0.	0.	0.
FEEDS MFR IND	17	0.	0.	0.	0.	0.	0.
FLOUR CER BAKERY IND	18	0.	0.	0.	0.	0.	0.
VEGETABLE OIL MILLS	19	0.	0.	0.	0.	0.	0.
SOFT DRINKS MFR IND	20	0.	0.	0.	0.	0.	0.
BEERS & ALC MFR IND	21	0.	0.	0.	0.	0.	0.
OTH FOOD MFR IND	22	0.	0.	0.	0.	0.	0.
RUBBER PROD IND	23	0.	0.	0.	0.	0.	0.
LEATHER PROD IND	24	0.	0.	0.	0.	0.	0.
TEXTILE PROD IND	25	0.	0.	0.	0.	0.	0.
KNITTING MILL IND	26	0.	0.	0.	0.	0.	0.
CLOTHING IND	27	0.	0.	0.	0.	0.	0.
WOOD PROD IND	28	0.	0.	0.	0.	0.	0.
FURNITURE IND	29	0.	0.	0.	0.	0.	0.
PULP & PAPER IND	30	0.	0.	0.	0.	0.	0.
PRINTING & PUBL IND	31	0.	0.	0.	0.	0.	0.
PRIMARY MET IND	32	0.	0.	0.	0.	0.	0.
METAL FAB IND	33	0.	0.	0.	0.	0.	0.
MACHINERY IND	34	0.	0.	0.	0.	0.	0.
TRANSP EQUIP IND	35	0.	0.	0.	0.	0.	0.
ELECTR APPL IND	36	0.	0.	0.	0.	0.	0.
CEMENT MFR IND	37	0.	0.	0.	0.	0.	0.
CONCRETE PROD IND	38	0.	0.	0.	0.	0.	0.
READY MIX MFR IND	39	0.	0.	0.	0.	0.	0.
OTH NON-METAL IND	40	0.	0.	0.	0.	0.	0.
PETROLEUM & COAL IND	41	0.	0.	0.	0.	0.	0.
FERTILIZER MFR IND	42	0.	0.	0.	0.	0.	0.
CHEMICAL & REL IND	43	0.	0.	0.	0.	0.	0.
MISC MFR IND	44	0.	0.	0.	0.	0.	0.
NON CONSTR IND	45	0.	0.	0.	0.	0.	0.
REPAIR CONSTR IND	46	0.	0.	0.	0.	0.	0.
TRANSP SERV IND	47	0.	0.	0.	0.	0.	0.
STORAGE SERV IND	48	0.	0.	0.	0.	0.	0.
COMMUNIC SERV IND	49	0.	0.	0.	0.	0.	0.
ELECTRICAL POWER	50	0.	0.	0.	0.	0.	0.
GAS DISTRIB IND	51	0.	0.	0.	0.	0.	0.
WATER & OTH IND	52	0.	0.	0.	0.	0.	0.
WHOLESALE TRADE	53	0.	0.	0.	0.	0.	0.
RETAIL TRADE	54	0.	0.	0.	0.	0.	0.
FINANCE	55	0.	0.	0.	0.	0.	0.
REAL ESTATE RENTAL	56	0.	0.	0.	0.	0.	0.
EDUCATION & RELATED	57	0.	0.	0.	0.	0.	0.
HOSPITAL & HEALTH	58	0.	0.	0.	0.	0.	0.
ACCOM & FOOD SERV	59	0.	0.	0.	0.	0.	0.
BUSINESS SERV IND	60	0.	0.	0.	0.	0.	0.
PERSONAL SERV IND	61	0.	0.	0.	0.	0.	0.
SUM		65886.	98607.	24555.	64640.	48722.	135484.

TABLE C-2 DOMESTIC MARKET SHARE MATRIX (CONTINUED)
(IN THOUSANDS OF 1972 DOLLARS)

PAGE

		POULTRY	EGGS IN SHELL	MILK, CREAM EXP	OTH AG PROD	FOREST PROD	FISHING, H & T
		7	8	9	10	11	12
WHEAT PRODUCERS	1	0.	0.	0.	0.	0.	0.
BARLEY PRODUCERS	2	0.	0.	0.	0.	0.	0.
OIL SEEDS PRDRS	3	0.	0.	0.	0.	0.	0.
OTH GRAIN PRDRS	4	0.	0.	0.	0.	0.	0.
FORAGE PRDRS	5	0.	0.	0.	0.	0.	0.
LIVESTOCK PRDRS	6	0.	0.	0.	0.	0.	0.
POULTRY & EGG PRDRS	7	10769.	6431.	0.	0.	0.	0.
DAIRY PRODUCERS	8	0.	0.	20254.	0.	0.	0.
OTH AG PRDRS	9	0.	0.	0.	10589.	0.	0.
FORESTRY PRDPS	10	0.	0.	0.	0.	4083.	0.
FISHING, H & T PRDPS	11	0.	0.	0.	0.	0.	2633.
COAL MINING IND	12	0.	0.	0.	0.	0.	0.
CRUDE OIL & GAS IND	13	0.	0.	0.	0.	0.	0.
OTH MINING IND	14	0.	0.	0.	0.	0.	0.
MEAT PROC IND	15	0.	0.	0.	0.	0.	0.
DAIRY INDUSTRY	16	0.	0.	0.	0.	0.	0.
FEEDS MFR IND	17	0.	0.	0.	0.	0.	0.
FLOUR OTH BAKERY IND	18	0.	0.	0.	0.	0.	0.
VEGETABLE OIL MILLS	19	0.	0.	0.	0.	0.	0.
SOFT DRINKS MFR IND	20	0.	0.	0.	0.	0.	0.
BEERS & ALC MFR IND	21	0.	0.	0.	0.	0.	0.
OTH FOOD MFR IND	22	0.	0.	0.	0.	0.	0.
RUBBER PROD IND	23	0.	0.	0.	0.	0.	0.
LEATHER PROD IND	24	0.	0.	0.	0.	0.	0.
TEXTILE PROD IND	25	0.	0.	0.	0.	0.	0.
KNITTING MILL IND	26	0.	0.	0.	0.	0.	0.
CLOTHING IND	27	0.	0.	0.	0.	0.	0.
WOOD PROD IND	28	0.	0.	0.	0.	0.	0.
FURNITURE IND	29	0.	0.	0.	0.	0.	0.
PULP & PAPER IND	30	0.	0.	0.	0.	0.	0.
PRINTING & PUBL IND	31	0.	0.	0.	0.	0.	0.
PRIMARY NFI IND	32	0.	0.	0.	0.	0.	0.
METAL FAB IND	33	0.	0.	0.	0.	0.	0.
MACHINERY IND	34	0.	0.	0.	0.	0.	0.
TRANSP EQUIP IND	35	0.	0.	0.	0.	0.	0.
ELECTR APPL IND	36	0.	0.	0.	0.	0.	0.
CEMENT MFR IND	37	0.	0.	0.	0.	0.	0.
CONCRETE PROD IND	38	0.	0.	0.	0.	0.	0.
READY MIX MFR IND	39	0.	0.	0.	0.	0.	0.
OTH NON-METAL IND	40	0.	0.	0.	0.	0.	0.
PETROLEUM & COAL IND	41	0.	0.	0.	0.	0.	0.
FERTILIZER MFR IND	42	0.	0.	0.	0.	0.	0.
CHEMICAL & REL IND	43	0.	0.	0.	0.	0.	0.
MISC MFR IND	44	0.	0.	0.	0.	0.	0.
NEW CONSTR IND	45	0.	0.	0.	0.	0.	0.
REPAIR CONSTR IND	46	0.	0.	0.	0.	0.	0.
TRANSP SERV IND	47	0.	0.	0.	0.	0.	0.
STORAGE SERV IND	48	0.	0.	0.	0.	0.	0.
COMMUNIC SERV IND	49	0.	0.	0.	0.	0.	0.
ELECTRICAL POWER	50	0.	0.	0.	0.	0.	0.
GAS DISTRIB IND	51	0.	0.	0.	0.	0.	0.
WATER & OTH IND	52	0.	0.	0.	0.	0.	0.
WHOLESALE TRADE	53	0.	0.	0.	0.	0.	0.
RETAIL TRADE	54	0.	0.	0.	0.	0.	0.
FINANCE	55	0.	0.	0.	0.	0.	0.
REAL ESTATE RENTAL	56	0.	0.	0.	0.	0.	0.
EDUCATION & RELATED	57	0.	0.	0.	0.	0.	0.
HOSPITAL & HEALTH	58	0.	0.	0.	0.	0.	0.
ACCOM & FOOD SERV	59	0.	0.	0.	0.	0.	0.
BUSINESS SERV IND	60	0.	0.	0.	0.	0.	0.
PERSONAL SERV IND	61	0.	0.	0.	0.	0.	0.
BOP		10769.	6431.	20254.	10589.	4083.	2633.

TABLE C-2 DOMESTIC MARKET SHARE MATRIX (CONTINUED)
(IN THOUSANDS OF 1972 DOLLARS)

PAGE

		COAL	CRUDE OIL	NATURAL GAS	PETROLEUM	OTH FIN PROD	MISC. FOOD ETC.
		13	14	15	16	17	18
WHEAT PRODUCERS	1	0.	0.	0.	0.	0.	0.
BARLEY PRODUCERS	2	0.	0.	0.	0.	0.	0.
OIL SEEDS PRODS	3	0.	0.	0.	0.	0.	0.
OTH GRAIN PRODS	4	0.	0.	0.	0.	0.	0.
FORAGE PRODS	5	0.	0.	0.	0.	0.	0.
LIVESTOCK PRODS	6	0.	0.	0.	0.	0.	0.
POULTRY & EGG PRODS	7	0.	0.	0.	0.	0.	0.
DAIRY PRODUCERS	8	0.	0.	0.	0.	0.	0.
OTH AG PRODS	9	0.	0.	0.	0.	0.	0.
FORESTRY PRODS	10	0.	0.	0.	0.	0.	0.
FISHING, H & T PRODS	11	0.	0.	0.	0.	0.	0.
COAL MINING IND	12	10671.	0.	0.	0.	0.	0.
CRUDE OIL & GAS IND	13	0.	579845.	158241.	7666.	0.	0.
OTH MINING IND	14	0.	0.	0.	0.	48661.	0.
MEAT PROC IND	15	0.	0.	0.	0.	0.	361625.
DAIRY INDUSTRY	16	0.	0.	0.	0.	0.	0.
FEEDS MFG IND	17	0.	0.	0.	0.	0.	0.
FLOUR CER BAKERY IND	18	0.	0.	0.	0.	0.	0.
VEGETABLE OIL MILLS	19	0.	0.	0.	0.	0.	0.
SOFT DRINKS MFG IND	20	0.	0.	0.	0.	0.	0.
BEERS & ALC MFG IND	21	0.	0.	0.	0.	0.	0.
OTH FOOD MFG IND	22	0.	0.	0.	0.	0.	0.
PAPERS PROD IND	23	0.	0.	0.	0.	0.	0.
LEATHER PROD IND	24	0.	0.	0.	0.	0.	0.
TEXTILE PROD IND	25	0.	0.	0.	0.	0.	0.
KNITTING MILL IND	26	0.	0.	0.	0.	0.	0.
CLOTHING IND	27	0.	0.	0.	0.	0.	0.
WOOD PROD IND	28	0.	0.	0.	0.	0.	0.
FURNITURE IND	29	0.	0.	0.	0.	0.	0.
PULP & PAPER IND	30	0.	0.	0.	0.	0.	0.
PRINTING & PUBL IND	31	0.	0.	0.	0.	0.	0.
PRIMARY NFI IND	32	0.	0.	0.	0.	0.	0.
METAL FAB IND	33	0.	0.	0.	0.	0.	0.
MACHINERY IND	34	0.	0.	0.	0.	0.	0.
TRANSP EQUIP IND	35	0.	0.	0.	0.	0.	0.
ELECTR APPL IND	36	0.	0.	0.	0.	0.	0.
OTHER MFT IND	37	0.	0.	0.	0.	0.	0.
CONCRETE PROD IND	38	0.	0.	0.	0.	0.	0.
READY MIX MFG IND	39	0.	0.	0.	0.	0.	0.
OTH NON-METAL IND	40	0.	0.	0.	0.	0.	0.
PETROLEUM & COAL IND	41	0.	0.	0.	0.	0.	0.
FERTILIZER MFG IND	42	0.	0.	0.	0.	0.	0.
CHEMICAL & REL IND	43	0.	0.	0.	0.	0.	0.
MISC MFG IND	44	0.	0.	0.	0.	0.	0.
MTN CONSTR IND	45	0.	0.	0.	0.	0.	0.
PIPAIR CONSTR IND	46	0.	0.	0.	0.	0.	0.
TRANSP SERV IND	47	0.	0.	0.	0.	0.	0.
STORAGE SERV IND	48	0.	0.	0.	0.	0.	0.
COMMUNIC SERV IND	49	0.	0.	0.	0.	0.	0.
ELECTRICAL POWER	50	0.	0.	0.	0.	0.	0.
GAS DISTRIB IND	51	0.	0.	0.	0.	0.	0.
WATER & OTH IND	52	0.	0.	0.	0.	0.	0.
WHOLESALE TRADE	53	0.	0.	0.	0.	0.	0.
RETAIL TRADE	54	0.	0.	0.	0.	0.	0.
FINANCE	55	0.	0.	0.	0.	0.	0.
REAL ESTATE RENTAL	56	0.	0.	0.	0.	0.	0.
EDUCATION & RELATED	57	0.	0.	0.	0.	0.	0.
HOSPITAL & HEALTH	58	0.	0.	0.	0.	0.	0.
ACCOM & FOOD SERV	59	0.	0.	0.	0.	0.	0.
BUSINESS SERV IND	60	0.	0.	0.	0.	0.	0.
PERSONAL SERV IND	61	0.	0.	0.	0.	0.	0.
SUM		10671.	579845.	158241.	7666.	48661.	361625.

PAGE

TABLE C-2 DOMESTIC MARKET SHARE MATRIX (CONTINUED)
(IN THOUSANDS OF 1972 DOLLARS)

		DAIRY, PROC	FEEDS NEC	VEG OIL PROD	FLOUR, CER & P	SOFT DRINKS	BEERS & ALC
		19	20	21	22	23	24
WHEAT PRODUCERS	1	0.	0.	0.	0.	0.	0.
BARLEY PRODUCERS	2	0.	0.	0.	0.	0.	0.
OIL SEEDS PRDRS	3	0.	0.	0.	0.	0.	0.
OTH GRAIN PRDRS	4	0.	0.	0.	0.	0.	0.
FORAGE PRDRS	5	0.	0.	0.	0.	0.	0.
LIVESTOCK PRDRS	6	0.	0.	0.	0.	0.	0.
POULTRY & EGG PRDRS	7	0.	0.	0.	0.	0.	0.
DAIRY PRODUCERS	8	0.	0.	0.	0.	0.	0.
OTH AG PRDRS	9	0.	0.	0.	0.	0.	0.
FORESTRY PRDRS	10	0.	0.	0.	0.	0.	0.
FISHING, H & T PRDRS	11	0.	0.	0.	0.	0.	0.
COAL MINING IND	12	0.	0.	0.	0.	0.	0.
CRUDE OIL & GAS IND	13	0.	0.	0.	0.	0.	0.
OTH MINING IND	14	0.	0.	0.	0.	0.	0.
MEAT PROC IND	15	0.	0.	0.	0.	0.	0.
DAIRY INDUSTRY	16	45177.	0.	0.	0.	0.	0.
FEEDS NEC IND	17	0.	14396.	0.	16361.	0.	0.
FLOUR CER BAKERY IND	18	0.	0.	9560.	0.	0.	0.
VEGETABLE OIL MILLS	19	0.	0.	0.	0.	10273.	0.
SOFT DRINKS NEC IND	20	0.	0.	0.	0.	0.	24789.
BEERS & ALC NEC IND	21	0.	0.	0.	0.	0.	0.
OTH FOOD NEC IND	22	0.	0.	0.	0.	0.	0.
TOBACCO PROD IND	23	0.	0.	0.	0.	0.	0.
LEATHER PROD IND	24	0.	0.	0.	0.	0.	0.
TEXTILE PROD IND	25	0.	0.	0.	0.	0.	0.
KNITTING MILL IND	26	0.	0.	0.	0.	0.	0.
CLOTHING IND	27	0.	0.	0.	0.	0.	0.
WOOD PROD IND	28	0.	0.	0.	0.	0.	0.
FURNITURE IND	29	0.	0.	0.	0.	0.	0.
PULP & PAPER IND	30	0.	0.	0.	0.	0.	0.
PRINTING & PUBL IND	31	0.	0.	0.	0.	0.	0.
PRIMARY NFI IND	32	0.	0.	0.	0.	0.	0.
METAL FAB IND	33	0.	0.	0.	0.	0.	0.
MACHINERY IND	34	0.	0.	0.	0.	0.	0.
TRANSP EQUIP IND	35	0.	0.	0.	0.	0.	0.
ELECTR APPL IND	36	0.	0.	0.	0.	0.	0.
CEMENT MFG IND	37	0.	0.	0.	0.	0.	0.
CONCRETE PROD IND	38	0.	0.	0.	0.	0.	0.
READY MIX MFG IND	39	0.	0.	0.	0.	0.	0.
OTH NON-METAL IND	40	0.	0.	0.	0.	0.	0.
PETROLEUM & COAL IND	41	0.	0.	0.	0.	0.	0.
FERTILIZER MFG IND	42	0.	0.	0.	0.	0.	0.
CHEMICAL & PHL IND	43	0.	0.	0.	0.	0.	0.
MISC MFG IND	44	0.	0.	0.	0.	0.	0.
NEW CONSTR IND	45	0.	0.	0.	0.	0.	0.
REPAIR CONSTR IND	46	0.	0.	0.	0.	0.	0.
TRANSP SERV IND	47	0.	0.	0.	0.	0.	0.
STORAGE SERV IND	48	0.	0.	0.	0.	0.	0.
COMMUNIC SERV IND	49	0.	0.	0.	0.	0.	0.
ELECTRICAL POWER	50	0.	0.	0.	0.	0.	0.
GAS DISTRIB IND	51	0.	0.	0.	0.	0.	0.
WATER & OTH IND	52	0.	0.	0.	0.	0.	0.
WHOLESALE TRADE	53	0.	0.	0.	0.	0.	0.
RETAIL TRADE	54	0.	0.	0.	0.	0.	0.
FINANCE	55	0.	0.	0.	0.	0.	0.
REAL ESTATE RENTAL	56	0.	0.	0.	0.	0.	0.
EDUCATION & RELATED	57	0.	0.	0.	0.	0.	0.
HOSPITAL & HEALTH	58	0.	0.	0.	0.	0.	0.
ACCOM & FOOD SERV	59	0.	0.	0.	0.	0.	0.
BUSINESS SERV IND	60	0.	0.	0.	0.	0.	0.
PERSONAL SERV IND	61	0.	0.	0.	0.	0.	0.
		45177.	14396.	9560.	16361.	10273.	24789.

SUM

TABLE C-2 DOMESTIC MARKET SHARE MATRIX (CONTINUED)
(IN THOUSANDS OF 1972 DOLLARS)

PAGE

		OTH FOODS, MIS	TIMBR & PROD	OTH MINRLS PROD	LEATHER PROD	TEXTILE PROD	HOSIERY & KNITTG
		25	26	27	28	29	30
WHEAT PRODUCERS	1	0.	0.	0.	0.	0.	0.
BARLEY PRODUCERS	2	0.	0.	0.	0.	0.	0.
OIL SEEDS PRDRS	3	0.	0.	0.	0.	0.	0.
OTH GRAIN PRDRS	4	0.	0.	0.	0.	0.	0.
FORAGE PRDRS	5	0.	0.	0.	0.	0.	0.
LIVESTOCK PRDRS	6	0.	0.	0.	0.	0.	0.
POULTRY & EGG PRDRS	7	0.	0.	0.	0.	0.	0.
DAIRY PRODUCERS	8	0.	0.	0.	0.	0.	0.
OTH AG PRDRS	9	0.	0.	0.	0.	0.	0.
FORESTRY PRDRS	10	0.	0.	0.	0.	0.	0.
FISHING, H & T PRDRS	11	0.	0.	0.	0.	0.	0.
COAL MINING IND	12	0.	0.	0.	0.	0.	0.
CRUDE OIL & GAS IND	13	0.	0.	0.	0.	0.	0.
OTH MINING IND	14	0.	0.	0.	0.	0.	0.
MEAT PROC IND	15	0.	0.	0.	0.	0.	0.
DAIRY INDUSTRY	16	0.	0.	0.	0.	0.	0.
FRUIT & VEG PRC IND	17	0.	0.	0.	0.	0.	0.
FLOUR GRN BAKERY IND	18	0.	0.	0.	0.	0.	0.
VEGETABLE OIL MILLS	19	0.	0.	0.	0.	0.	0.
SOFT DRINKS MFR IND	20	0.	0.	0.	0.	0.	0.
BEERS & ALC MFR IND	21	0.	0.	0.	0.	0.	0.
OTH FOOD MFR IND	22	2749.	0.	0.	0.	0.	0.
PULPWD PROD IND	23	0.	7966.	5275.	0.	0.	0.
LEATHER PROD IND	24	0.	0.	0.	2247.	0.	0.
TEXTILE PROD IND	25	0.	0.	0.	0.	12127.	0.
KNITTING MILL IND	26	0.	0.	0.	0.	0.	2033.
CLOTHING IND	27	0.	0.	0.	0.	0.	0.
WOOD PROD IND	28	0.	0.	0.	0.	0.	0.
FURNITURE IND	29	0.	0.	0.	0.	0.	0.
PULP & PAPER IND	30	0.	0.	0.	0.	0.	0.
PRINTING & PUBL IND	31	0.	0.	0.	0.	0.	0.
PRIMARY MET IND	32	0.	0.	0.	0.	0.	0.
METAL FAB IND	33	0.	0.	0.	0.	0.	0.
MACHINERY IND	34	0.	0.	0.	0.	0.	0.
TRANSP EQUIP IND	35	0.	0.	0.	0.	0.	0.
ELECTP APPL IND	36	0.	0.	0.	0.	0.	0.
CEMENT MFR IND	37	0.	0.	0.	0.	0.	0.
CONCRETE PROD IND	38	0.	0.	0.	0.	0.	0.
READY MIX MFR IND	39	0.	0.	0.	0.	0.	0.
OTH NON-METAL IND	40	0.	0.	0.	0.	0.	0.
PETROLEUM & COAL IND	41	0.	0.	0.	0.	0.	0.
FERTILIZER MFR IND	42	0.	0.	0.	0.	0.	0.
CHEMICAL & REL IND	43	0.	0.	0.	0.	0.	0.
MISC MFR IND	44	0.	0.	0.	0.	0.	0.
NEW CONSTR IND	45	0.	0.	0.	0.	0.	0.
REPAIR CONSTR IND	46	0.	0.	0.	0.	0.	0.
TRANSP SERV IND	47	0.	0.	0.	0.	0.	0.
STORAGE SERV IND	48	0.	0.	0.	0.	0.	0.
COMMUNIC SERV IND	49	0.	0.	0.	0.	0.	0.
ELECTRICAL POWER	50	0.	0.	0.	0.	0.	0.
GAS DISTRIB IND	51	0.	0.	0.	0.	0.	0.
WATER & OTH IND	52	0.	0.	0.	0.	0.	0.
WHOLESALE TRADE	53	0.	0.	0.	0.	0.	0.
RETAIL TRADE	54	0.	0.	0.	0.	0.	0.
FINANCE	55	0.	0.	0.	0.	0.	0.
REAL ESTATE RENTAL	56	0.	0.	0.	0.	0.	0.
EDUCATION & RELATED	57	0.	0.	0.	0.	0.	0.
HOSPITAL & HEALTH	58	0.	0.	0.	0.	0.	0.
ACCOM & FOOD SERV	59	0.	0.	0.	0.	0.	0.
BUS/PERS SERV IND	60	0.	0.	0.	0.	0.	0.
PERSONAL SERV IND	61	0.	0.	0.	0.	0.	0.
SUM		2749.	7966.	5275.	2247.	12127.	2033.

TABLE C-2 DOMESTIC MARKET SHARE MATRIX (CONTINUED)
(IN THOUSANDS OF 1972 DOLLARS)

PAGE

		CLOTHING	LUMBER & PLYWOOD	WOOD PROD NES	FURNIT & FIX	PULP & PAPER	PRINTING & PUB
		31	32	33	34	35	36
WHEAT PRODUCERS	1	0.	0.	0.	0.	0.	0.
BARLEY PRODUCERS	2	0.	0.	0.	0.	0.	0.
OIL SEEDS PRDRS	3	0.	0.	0.	0.	0.	0.
OTH GRAIN PRDRS	4	0.	0.	0.	0.	0.	0.
FORAGE PRDRS	5	0.	0.	0.	0.	0.	0.
LIVESTOCK PRDRS	6	0.	0.	0.	0.	0.	0.
POULTRY & EGG PRDRS	7	0.	0.	0.	0.	0.	0.
DAIRY PRODUCERS	8	0.	0.	0.	0.	0.	0.
OTH AG PRDRS	9	0.	0.	0.	0.	0.	0.
FORESTRY PRDRS	10	0.	0.	0.	0.	0.	0.
FISHING, H & T PRDRS	11	0.	0.	0.	0.	0.	0.
COAL MINING IND	12	0.	0.	0.	0.	0.	0.
CRUDE OIL & GAS IND	13	0.	0.	0.	0.	0.	0.
OTH MINING IND	14	0.	0.	0.	0.	0.	0.
MEAT PROC IND	15	0.	0.	0.	0.	0.	0.
DAIRY INDUSTRY	16	0.	0.	0.	0.	0.	0.
FEEDS MFR IND	17	0.	0.	0.	0.	0.	0.
FLOUR CER BAKERY IND	18	0.	0.	0.	0.	0.	0.
VEGETABLE OIL MILLS	19	0.	0.	0.	0.	0.	0.
SOFT DRINKS MFR IND	20	0.	0.	0.	0.	0.	0.
BEERS & ALC MFR IND	21	0.	0.	0.	0.	0.	0.
OTH FOOD MFR IND	22	0.	0.	0.	0.	0.	0.
RUBBER PROD IND	23	0.	0.	0.	0.	0.	0.
LEATHER PROD IND	24	0.	0.	0.	0.	0.	0.
TEXTILE PROD IND	25	0.	0.	0.	0.	0.	0.
KNITTING MILL IND	26	0.	0.	0.	0.	0.	0.
CLOTHING IND	27	21369.	0.	0.	0.	0.	0.
WOOD PROD IND	28	0.	14610.	23594.	0.	0.	0.
FURNITURE IND	29	0.	0.	0.	15243.	0.	0.
PULP & PAPER IND	30	0.	0.	0.	0.	13167.	0.
PRINTING & PUBL IND	31	0.	0.	0.	0.	0.	34127.
PRIMARY MET IND	32	0.	0.	0.	0.	0.	0.
METAL FAB IND	33	0.	0.	0.	0.	0.	0.
MACHINERY IND	34	0.	0.	0.	0.	0.	0.
TRANSP EQUIP IND	35	0.	0.	0.	0.	0.	0.
ELECTR APPL IND	36	0.	0.	0.	0.	0.	0.
CEMENT MFR IND	37	0.	0.	0.	0.	0.	0.
CONCRETE PROD IND	38	0.	0.	0.	0.	0.	0.
READY MIX MFR IND	39	0.	0.	0.	0.	0.	0.
OTH NON-METAL IND	40	0.	0.	0.	0.	0.	0.
PETROLEUM & COAL IND	41	0.	0.	0.	0.	0.	0.
FERTILIZER MFR IND	42	0.	0.	0.	0.	0.	0.
CHEMICAL & REL IND	43	0.	0.	0.	0.	0.	0.
MISC MFR IND	44	0.	0.	0.	0.	0.	0.
NEW CONSTR IND	45	0.	0.	0.	0.	0.	0.
REPAIR CONSTR IND	46	0.	0.	0.	0.	0.	0.
TRANSP SERV IND	47	0.	0.	0.	0.	0.	0.
STORAGE SERV IND	48	0.	0.	0.	0.	0.	0.
COMMUNIC SERV IND	49	0.	0.	0.	0.	0.	0.
ELECTRICAL POWER	50	0.	0.	0.	0.	0.	0.
GAS DISTRIB IND	51	0.	0.	0.	0.	0.	0.
WATER & OTH IND	52	0.	0.	0.	0.	0.	0.
WHOLESALE TRADE	53	0.	0.	0.	0.	0.	0.
RETAIL TRADE	54	0.	0.	0.	0.	0.	0.
FINANCE	55	0.	0.	0.	0.	0.	0.
REAL ESTATE RENTAL	56	0.	0.	0.	0.	0.	0.
EDUCATION & RELATED	57	0.	0.	0.	0.	0.	0.
HOSPITAL & HEALTH	58	0.	0.	0.	0.	0.	0.
ACCOM & FOOD SERV	59	0.	0.	0.	0.	0.	0.
BUSINESS SERV IND	60	0.	0.	0.	0.	0.	0.
PERSONAL SERV IND	61	0.	0.	0.	0.	0.	0.
SUM		21369.	14610.	23594.	15243.	13167.	34127.

TABLE C-2 DOMESTIC MARKET SHARE-MATRIX (CONTINUED)
(IN THOUSANDS OF 1972 DOLLARS)

PAGE

		IRON & STEEL	OTH PRIM METAL	METAL FAB PROD	MACHINERY	VEHICLES & OTH TRANS	ELECT APPLIANCES
		37	38	39	40	41	42
WHEAT PRODUCERS	1	0.	0.	0.	0.	0.	0.
BARLEY PRODUCERS	2	0.	0.	0.	0.	0.	0.
OIL SEEDS PRDRS	3	0.	0.	0.	0.	0.	0.
OTH GRAIN PRDRS	4	0.	0.	0.	0.	0.	0.
FORAGE PRDRS	5	0.	0.	0.	0.	0.	0.
LIVESTOCK PRDPS	6	0.	0.	0.	0.	0.	0.
POULTRY & EGG PRDRS	7	0.	0.	0.	0.	0.	0.
DAIRY PRODUCERS	8	0.	0.	0.	0.	0.	0.
OTH AG PRDRS	9	0.	0.	0.	0.	0.	0.
FORESTRY PRDRS	10	0.	0.	0.	0.	0.	0.
FISHING, H & T PRDRS	11	0.	0.	0.	0.	0.	0.
COAL MINING IND	12	0.	0.	0.	0.	0.	0.
CRUDE OIL & GAS IND	13	0.	0.	0.	0.	0.	0.
OTH MINING IND	14	0.	0.	0.	0.	0.	0.
MEAT PROC IND	15	0.	0.	0.	0.	0.	0.
DAIRY INDUSTRY	16	0.	0.	0.	0.	0.	0.
FEEDS MFR IND	17	0.	0.	0.	0.	0.	0.
FLOUR CER BAKERY IND	18	0.	0.	0.	0.	0.	0.
VEGETABLE OIL MILLS	19	0.	0.	0.	0.	0.	0.
SOFT DRINKS MFR IND	20	0.	0.	0.	0.	0.	0.
BEERS & ALC MFR IND	21	0.	0.	0.	0.	0.	0.
OTH FOOD MFR IND	22	0.	0.	0.	0.	0.	0.
RUBBER PROD IND	23	0.	0.	0.	0.	0.	0.
LEATHER PROD IND	24	0.	0.	0.	0.	0.	0.
TEXTILE PROD IND	25	0.	0.	0.	0.	0.	0.
KNITTING MILL IND	26	0.	0.	0.	0.	0.	0.
CLOTHING IND	27	0.	0.	0.	0.	0.	0.
WOOD PROD IND	28	0.	0.	0.	0.	0.	0.
FURNITURE IND	29	0.	0.	0.	0.	0.	0.
PULP & PAPER IND	30	0.	0.	0.	0.	0.	0.
PRINTING & PUBL IND	31	0.	0.	0.	0.	0.	0.
PRIMARY MET IND	32	32416.	18560.	0.	0.	0.	0.
METAL FAB IND	33	0.	0.	70256.	0.	0.	0.
MACHINERY IND	34	0.	0.	0.	24955.	0.	0.
TRANSP EQUIP IND	35	0.	0.	0.	0.	28885.	0.
ELECTR APPL IND	36	0.	0.	0.	0.	0.	1956.
CEMENT MFR IND	37	0.	0.	0.	0.	0.	0.
CONCRETE PROD IND	38	0.	0.	0.	0.	0.	0.
READY MIX MFR IND	39	0.	0.	0.	0.	0.	0.
OTH NON-METAL IND	40	0.	0.	0.	0.	0.	0.
PETROLEUM & COAL IND	41	0.	0.	0.	0.	0.	0.
FERTILIZER MFR IND	42	0.	0.	0.	0.	0.	0.
CHEMICAL & REL IND	43	0.	0.	0.	0.	0.	0.
MISC MFR IND	44	0.	0.	0.	0.	0.	0.
NEW CONSTR IND	45	0.	0.	0.	0.	0.	0.
REPAIR CONSTR IND	46	0.	0.	0.	0.	0.	0.
TRANSP SERV IND	47	0.	0.	0.	0.	0.	0.
STORAGE SERV IND	48	0.	0.	0.	0.	0.	0.
COMMUNIC SERV IND	49	0.	0.	0.	0.	0.	0.
ELECTRICAL POWER	50	0.	0.	0.	0.	0.	0.
GAS DISTRIB IND	51	0.	0.	0.	0.	0.	0.
WATER & OTH IND	52	0.	0.	0.	0.	0.	0.
WHOLESALE TRADE	53	0.	0.	0.	0.	0.	0.
RETAIL TRADE	54	0.	0.	0.	0.	0.	0.
FINANCE	55	0.	0.	0.	0.	0.	0.
REAL ESTATE RENTAL	56	0.	0.	0.	0.	0.	0.
EDUCATION & RELATED	57	0.	0.	0.	0.	0.	0.
HOSPITAL & HEALTH	58	0.	0.	0.	0.	0.	0.
ACCOM & FOOD SERV	59	0.	0.	0.	0.	0.	0.
BUSINESS SERV IND	60	0.	0.	0.	0.	0.	0.
PERSONAL SERV IND	61	0.	0.	0.	0.	0.	0.
SUM		32416.	18560.	70256.	24955.	28885.	1956.

TABLE C-2 DOMESTIC MARKET SHARE MATRIX (CONTINUED)
(IN THOUSANDS OF 1972 DOLLARS)

PAGE

		CEMENT	OTH NON-MET	PETROLEUM	FERTILIZER	CHEMICAL	MISC MFR
		43	44	45	46	47	48
WHEAT PRODUCERS	1	0.	0.	0.	0.	0.	0.
BARLEY PRODUCERS	2	0.	0.	0.	0.	0.	0.
OIL SEEDS PRDRS	3	0.	0.	0.	0.	0.	0.
OTH GRAIN PRDRS	4	0.	0.	0.	0.	0.	0.
FORAGE PRDRS	5	0.	0.	0.	0.	0.	0.
LIVESTOCK PRDRS	6	0.	0.	0.	0.	0.	0.
POULTRY & EGG PRDRS	7	0.	0.	0.	0.	0.	0.
DAIRY PRODUCERS	8	0.	0.	0.	0.	0.	0.
OTH AG PRDRS	9	0.	0.	0.	0.	0.	0.
FORESTRY PRDRS	10	0.	0.	0.	0.	0.	0.
FISHING, H & T PRDRS	11	0.	0.	0.	0.	0.	0.
COAL MINING IND	12	0.	0.	0.	0.	0.	0.
CRUDE OIL & GAS IND	13	0.	0.	0.	0.	0.	0.
OTH MINING IND	14	0.	0.	0.	0.	0.	0.
MEAT PROC IND	15	0.	0.	0.	0.	0.	0.
DAIRY INDUSTRY	16	0.	0.	0.	0.	0.	0.
FEEDS MFR IND	17	0.	0.	0.	0.	0.	0.
FLOUR CER BAKERY IND	18	0.	0.	0.	0.	0.	0.
VEGETABLE OIL MILLS	19	0.	0.	0.	0.	0.	0.
SOFT DRINKS MFR IND	20	0.	0.	0.	0.	0.	0.
BEERS & ALC MFR IND	21	0.	0.	0.	0.	0.	0.
OTH FOOD MFR IND	22	0.	0.	0.	0.	0.	0.
RUBBER PROD IND	23	0.	0.	0.	0.	0.	0.
LEATHER PROD IND	24	0.	0.	0.	0.	0.	0.
TEXTILE PROD IND	25	0.	0.	0.	0.	0.	0.
KNITTING MILL IND	26	0.	0.	0.	0.	0.	0.
CLOTHING IND	27	0.	0.	0.	0.	0.	0.
WOOD PROD IND	28	0.	0.	0.	0.	0.	0.
FURNITURE IND	29	0.	0.	0.	0.	0.	0.
PULP & PAPER IND	30	0.	0.	0.	0.	0.	0.
PRINTING & PUBL IND	31	0.	0.	0.	0.	0.	0.
PRIMARY MET IND	32	0.	0.	0.	0.	0.	0.
METAL FAB IND	33	0.	0.	0.	0.	0.	0.
MACHINERY IND	34	0.	0.	0.	0.	0.	0.
TRANSP EQUIP IND	35	0.	0.	0.	0.	0.	0.
ELECTR APPL IND	36	0.	0.	0.	0.	0.	0.
CEMENT MFR IND	37	15850.	0.	0.	0.	0.	0.
CONCRETE PROD IND	38	0.	25622.	0.	0.	0.	0.
READY MIX MFR IND	39	0.	22537.	0.	0.	0.	0.
OTH NON-METAL IND	40	0.	17432.	0.	0.	0.	0.
PETROLEUM & COAL IND	41	0.	0.	195567.	0.	0.	0.
FERTILIZER MFR IND	42	0.	0.	0.	78513.	0.	0.
CHEMICAL & REL IND	43	0.	0.	0.	0.	85694.	0.
MISC MFR IND	44	0.	0.	0.	0.	0.	9343.
NEW CONSTR IND	45	0.	0.	0.	0.	0.	0.
REPAIR CONSTR IND	46	0.	0.	0.	0.	0.	0.
TRANSP SERV IND	47	0.	0.	0.	0.	0.	0.
STORAGE SERV IND	48	0.	0.	0.	0.	0.	0.
COMMUNIC SERV IND	49	0.	0.	0.	0.	0.	0.
ELECTRICAL POWER	50	0.	0.	0.	0.	0.	0.
GAS DISTRIB IND	51	0.	0.	0.	0.	0.	0.
WATER & OTH IND	52	0.	0.	0.	0.	0.	0.
WHOLESALE TRADE	53	0.	0.	0.	0.	0.	0.
RETAIL TRADE	54	0.	0.	0.	0.	0.	0.
FINANCE	55	0.	0.	0.	0.	0.	0.
REAL ESTATE RENTAL	56	0.	0.	0.	0.	0.	0.
EDUCATION & RELATED	57	0.	0.	0.	0.	0.	0.
HOSPITAL & HEALTH	58	0.	0.	0.	0.	0.	0.
ACCOM & FOOD SERV	59	0.	0.	0.	0.	0.	0.
BUSINESS SERV IND	60	0.	0.	0.	0.	0.	0.
PERSONAL SERV IND	61	0.	0.	0.	0.	0.	0.
SUM		15850.	65591.	195567.	78513.	85694.	9343.

TABLE C-2 DOMESTIC MARKET SHARE MATRIX (CONTINUED)
(IN THOUSANDS OF 1972 DOLLARS)

PAGE

		NEW CONSTRUCT	REPAIR CONSTRUCT	TRANSP SERV	STORAGE SERV	COMMUNIC	ELECT POWER
		49	50	51	52	53	54
WHEAT PRODUCERS	1	0.	0.	0.	0.	0.	0.
BARLEY PRODUCERS	2	0.	0.	0.	0.	0.	0.
OIL SEEDS PRDRS	3	0.	0.	0.	0.	0.	0.
OTH GRAIN PRDRS	4	0.	0.	0.	0.	0.	0.
FORAGE PRDRS	5	0.	0.	0.	0.	0.	0.
LIVESTOCK PRDRS	6	0.	0.	0.	0.	0.	0.
POULTRY & EGG PRDRS	7	0.	0.	0.	0.	0.	0.
DAIRY PRODUCERS	8	0.	0.	0.	0.	0.	0.
OTH AG PRDRS	9	0.	0.	0.	0.	0.	0.
FORESTRY PRDRS	10	0.	0.	0.	0.	0.	0.
FISHING, H & T PRDRS	11	0.	0.	0.	0.	0.	0.
COAL MINING IND	12	0.	0.	0.	0.	0.	0.
CRUDE OIL & GAS IND	13	0.	0.	0.	0.	0.	0.
OTH MINING IND	14	0.	0.	0.	0.	0.	0.
MEAT PROC IND	15	0.	0.	0.	0.	0.	0.
DAIRY INDUSTRY	16	0.	0.	0.	0.	0.	0.
FEEDS MFR IND	17	0.	0.	0.	0.	0.	0.
FLOUR CER BAKERY IND	18	0.	0.	0.	0.	0.	0.
VEGETABLE OIL MILLS	19	0.	0.	0.	0.	0.	0.
SOFT DRINKS MFR IND	20	0.	0.	0.	0.	0.	0.
BEERS & ALC MFR IND	21	0.	0.	0.	0.	0.	0.
OTH FOOD MFR IND	22	0.	0.	0.	0.	0.	0.
RUBBER PROD IND	23	0.	0.	0.	0.	0.	0.
LEATHER PROD IND	24	0.	0.	0.	0.	0.	0.
TEXTILE PROD IND	25	0.	0.	0.	0.	0.	0.
KNITTING MILL IND	26	0.	0.	0.	0.	0.	0.
CLOTHING IND	27	0.	0.	0.	0.	0.	0.
WOOD PROD IND	28	0.	0.	0.	0.	0.	0.
FURNITURE IND	29	0.	0.	0.	0.	0.	0.
PULP & PAPER IND	30	0.	0.	0.	0.	0.	0.
PRINTING & PUBL IND	31	0.	0.	0.	0.	0.	0.
PRIMARY MFT IND	32	0.	0.	0.	0.	0.	0.
METAL FAB IND	33	0.	0.	0.	0.	0.	0.
MACHINERY IND	34	0.	0.	0.	0.	0.	0.
TRANSP EQUIP IND	35	0.	0.	0.	0.	0.	0.
ELECTR APPL IND	36	0.	0.	0.	0.	0.	0.
CEMENT MFR IND	37	0.	0.	0.	0.	0.	0.
CONCRETE PROD IND	38	0.	0.	0.	0.	0.	0.
READY MIX MFR IND	39	0.	0.	0.	0.	0.	0.
OTH NON-METAL IND	40	0.	0.	0.	0.	0.	0.
PETROLEUM & COAL IND	41	0.	0.	0.	0.	0.	0.
FERTILIZER MFR IND	42	0.	0.	0.	0.	0.	0.
CHEMICAL & REL IND	43	0.	0.	0.	0.	0.	0.
MISC MFR IND	44	0.	0.	0.	0.	0.	0.
NEW CONSTR IND	45	763795.	0.	0.	0.	0.	0.
REPAIR CONSTR IND	46	0.	114130.	0.	0.	0.	0.
TRANSP SERV IND	47	0.	0.	220000.	0.	0.	0.
STORAGE SERV IND	48	0.	0.	0.	26186.	0.	0.
COMMUNIC SERV IND	49	0.	0.	0.	0.	106357.	0.
ELECTRICAL POWER	50	0.	0.	0.	0.	0.	116813.
GAS DISTRIB IND	51	0.	0.	0.	0.	0.	0.
WATER & OTH IND	52	0.	0.	0.	0.	0.	0.
WHOLESALE TRADE	53	0.	0.	0.	0.	0.	0.
RETAIL TRADE	54	0.	0.	0.	0.	0.	0.
FINANCE	55	0.	0.	0.	0.	0.	0.
REAL ESTATE RENTAL	56	0.	0.	0.	0.	0.	0.
EDUCATION & RELATED	57	0.	0.	0.	0.	0.	0.
HOSPITAL & HEALTH	58	0.	0.	0.	0.	0.	0.
ACCOM & FOOD SERV	59	0.	0.	0.	0.	0.	0.
BUSINESS SERV IND	60	0.	0.	0.	0.	0.	0.
PERSONAL SERV IND	61	0.	0.	0.	0.	0.	0.
SUM		763795.	114130.	220000.	26186.	106357.	116813.

TABLE C-2 DOMESTIC MARKET SHARE MATRIX (CONTINUED)
(IN THOUSANDS OF 1972 DOLLARS)

PAGE

		GAS PIPE SERV	WATER & OTH	WHOLESALE	RETAIL	FINANCE & OTH	REAL ESTATE
		55	56	57	58	59	60
WHEAT PRODUCERS	1	0.	0.	0.	0.	0.	0.
BARLEY PRODUCERS	2	0.	0.	0.	0.	0.	0.
OIL SEEDS PRDRS	3	0.	0.	0.	0.	0.	0.
OTH GRAIN PRDRS	4	0.	0.	0.	0.	0.	0.
FORAGE PRDRS	5	0.	0.	0.	0.	0.	0.
LIVESTOCK PRDRS	6	0.	0.	0.	0.	0.	0.
POULTRY & EGG PRDRS	7	0.	0.	0.	0.	0.	0.
DAIRY PRODUCERS	8	0.	0.	0.	0.	0.	0.
OTH AG PRDRS	9	0.	0.	0.	0.	0.	0.
FORESTRY PRDRS	10	0.	0.	0.	0.	0.	0.
FISHING, H & T PRDRS	11	0.	0.	0.	0.	0.	0.
COAL MINING IND	12	0.	0.	0.	0.	0.	0.
CRUDE OIL & GAS IND	13	0.	0.	0.	0.	0.	0.
OTH MINING IND	14	0.	0.	0.	0.	0.	0.
MEAT PROC IND	15	0.	0.	0.	0.	0.	0.
DAIRY INDUSTRY	16	0.	0.	0.	0.	0.	0.
FEEDS MFR IND	17	0.	0.	0.	0.	0.	0.
FLOUR GER BAKERY IND	18	0.	0.	0.	0.	0.	0.
VEGETABLE OIL MILLS	19	0.	0.	0.	0.	0.	0.
SOFT DRINKS MFR IND	20	0.	0.	0.	0.	0.	0.
BEERS & ALC MFR IND	21	0.	0.	0.	0.	0.	0.
OTH FOOD MFR IND	22	0.	0.	0.	0.	0.	0.
RUBBER PROD IND	23	0.	0.	0.	0.	0.	0.
LEATHER PROD IND	24	0.	0.	0.	0.	0.	0.
TEXTILE PROD IND	25	0.	0.	0.	0.	0.	0.
KNITTING MILL IND	26	0.	0.	0.	0.	0.	0.
CLOTHING IND	27	0.	0.	0.	0.	0.	0.
WOOD PROD IND	28	0.	0.	0.	0.	0.	0.
FURNITURE IND	29	0.	0.	0.	0.	0.	0.
PULP & PAPER IND	30	0.	0.	0.	0.	0.	0.
PRINTING & PUBL IND	31	0.	0.	0.	0.	0.	0.
PRIMARY MET IND	32	0.	0.	0.	0.	0.	0.
METAL FAB IND	33	0.	0.	0.	0.	0.	0.
MACHINERY IND	34	0.	0.	0.	0.	0.	0.
TRANSP EQUIP IND	35	0.	0.	0.	0.	0.	0.
ELECTR APPL IND	36	0.	0.	0.	0.	0.	0.
CEMENT MFR IND	37	0.	0.	0.	0.	0.	0.
CONCRETE PROD IND	38	0.	0.	0.	0.	0.	0.
READY MIX MFR IND	39	0.	0.	0.	0.	0.	0.
OTH NON-METAL IND	40	0.	0.	0.	0.	0.	0.
PETROLEUM & COAL IND	41	0.	0.	0.	0.	0.	0.
FERTILIZER MFR IND	42	0.	0.	0.	0.	0.	0.
CHEMICAL & REL IND	43	0.	0.	0.	0.	0.	0.
MISC MFR IND	44	0.	0.	0.	0.	0.	0.
NEW CONSTR IND	45	0.	0.	0.	0.	0.	0.
REPAIR CONSTR IND	46	0.	0.	0.	0.	0.	0.
TRANSP SERV IND	47	0.	0.	0.	0.	0.	0.
STORAGE SERV IND	48	0.	0.	0.	0.	0.	0.
COMMUNIC SERV IND	49	0.	0.	0.	0.	0.	0.
ELECTRICAL POWER	50	0.	0.	0.	0.	0.	0.
GAS DISTRIB IND	51	40687.	0.	0.	0.	0.	0.
WATER & OTH IND	52	0.	11600.	0.	0.	0.	0.
WHOLESALE TRADE	53	0.	0.	132839.	0.	0.	0.
RETAIL TRADE	54	0.	0.	0.	395437.	0.	0.
FINANCE	55	0.	0.	0.	0.	426200.	0.
REAL ESTATE RENTAL	56	0.	0.	0.	0.	0.	386203.
EDUCATION & RELATED	57	0.	0.	0.	0.	0.	0.
HOSPITAL & HEALTH	58	0.	0.	0.	0.	0.	0.
ACCOM & FOOD SERV	59	0.	0.	0.	0.	0.	0.
BUSINESS SERV IND	60	0.	0.	0.	0.	0.	0.
PERSONAL SERV IND	61	0.	0.	0.	0.	0.	0.
SUP		40687.	11600.	132839.	395437.	426200.	386203.

TABLE C-2 DOMESTIC MARKET SHARE MATRIX (CONTINUED) PAGE
(IN THOUSANDS OF 1972 DOLLARS)

		EDUCATION	HEALTH SERV	ACCOM & FOOD	BUSINESS SERV	PERSONAL SERV
		61	62	63	64	65
WHEAT PRODUCERS	1	0.	0.	0.	0.	0.
BARLEY PRODUCERS	2	0.	0.	0.	0.	0.
OIL SEEDS PRDRS	3	0.	0.	0.	0.	0.
OTH GRAIN PRDRS	4	0.	0.	0.	0.	0.
FORAGE PRDRS	5	0.	0.	0.	0.	0.
LIVESTOCK PRDRS	6	0.	0.	0.	0.	0.
POULTRY & EGG PRDRS	7	0.	0.	0.	0.	0.
DAIRY PRODUCERS	8	0.	0.	0.	0.	0.
OTH AG PRDRS	9	0.	0.	0.	0.	0.
FORESTRY PRDRS	10	0.	0.	0.	0.	0.
FISHING, H & T PRDRS	11	0.	0.	0.	0.	0.
COAL MINING IND	12	0.	0.	0.	0.	0.
CRUDE OIL & GAS IND	13	0.	0.	0.	0.	0.
OTH MINING IND	14	0.	0.	0.	0.	0.
MEAT PROC IND	15	0.	0.	0.	0.	0.
DAIRY INDUSTRY	16	0.	0.	0.	0.	0.
FEEDS MFR IND	17	0.	0.	0.	0.	0.
FLOUR CER BAKERY IND	18	0.	0.	0.	0.	0.
VEGETABLE OIL MILLS	19	0.	0.	0.	0.	0.
SOFT DRINKS MFR IND	20	0.	0.	0.	0.	0.
BEERS & ALC MFR IND	21	0.	0.	0.	0.	0.
OTH FOOD MFR IND	22	0.	0.	0.	0.	0.
RUBBER PROD IND	23	0.	0.	0.	0.	0.
LEATHER PROD IND	24	0.	0.	0.	0.	0.
TEXTILE PROD IND	25	0.	0.	0.	0.	0.
KNITTING MILL IND	26	0.	0.	0.	0.	0.
CLOTHING IND	27	0.	0.	0.	0.	0.
WOOD PROD IND	28	0.	0.	0.	0.	0.
FURNITURE IND	29	0.	0.	0.	0.	0.
PULP & PAPER IND	30	0.	0.	0.	0.	0.
PRINTING & PUBL IND	31	0.	0.	0.	0.	0.
PRIMARY MET IND	32	0.	0.	0.	0.	0.
METAL FAB IND	33	0.	0.	0.	0.	0.
MACHINERY IND	34	0.	0.	0.	0.	0.
TRANSP EQUIP IND	35	0.	0.	0.	0.	0.
ELECTR APPL IND	36	0.	0.	0.	0.	0.
CEMENT MFR IND	37	0.	0.	0.	0.	0.
CONCRETE PROD IND	38	0.	0.	0.	0.	0.
READY MIX MFR IND	39	0.	0.	0.	0.	0.
OTH NON-METAL IND	40	0.	0.	0.	0.	0.
PETROLEUM & COAL IND	41	0.	0.	0.	0.	0.
FERTILIZER MFR IND	42	0.	0.	0.	0.	0.
CHEMICAL & REL IND	43	0.	0.	0.	0.	0.
MISC MFR IND	44	0.	0.	0.	0.	0.
NEW CONSTR IND	45	0.	0.	0.	0.	0.
REPAIR CONSTR IND	46	0.	0.	0.	0.	0.
TRANSP SERV IND	47	0.	0.	0.	0.	0.
STORAGE SERV IND	48	0.	0.	0.	0.	0.
COMMUNIC SERV IND	49	0.	0.	0.	0.	0.
ELECTRICAL POWER	50	0.	0.	0.	0.	0.
GAS DISTRIB IND	51	0.	0.	0.	0.	0.
WATER & OTH IND	52	0.	0.	0.	0.	0.
WHOLESALE TRADE	53	0.	0.	0.	0.	0.
RETAIL TRADE	54	0.	0.	0.	0.	0.
FINANCE	55	0.	0.	0.	0.	0.
REAL ESTATE RENTAL	56	0.	0.	0.	0.	0.
EDUCATION & RELATED	57	248000.	0.	0.	0.	0.
HOSPITAL & HEALTH	58	0.	105000.	0.	0.	0.
ACCOM & FOOD SERV	59	0.	0.	126754.	0.	0.
BUSINESS SERV IND	60	0.	0.	0.	130500.	0.
PERSONAL SERV IND	61	0.	0.	0.	0.	185700.
SUM		248000.	105000.	126754.	130500.	185700.

TABLE C-3 PRODUCTION TECHNOLOGY COEFFICIENTS

PAGE

		WHEAT PRODUCERS 1	BARLEY PRDRS 2	OIL SEEDS PRDRS 3	OTH GRAIN PRDRS 4	FORAGE PRDRS 5	LIVESTOCK PRDRS 6
WHEAT, UNMILLED	1	0.0714811	0.0	0.0	0.0	0.0	0.0
BARLEY,UNMILLED	2	0.0	0.0680263	0.0	0.0	0.0	0.1126497
OIL SEEDS	3	0.0	0.0	0.0624240	0.0	0.0	0.0
OTH CEREAL CROPS	4	0.0	0.0	0.0	0.0453744	0.0397973	0.1820533
HAY, FORAGE	5	0.0	0.0	0.0	0.0	0.0	0.3268055
LIVESTOCK	6	0.0	0.0	0.0	0.0	0.0	0.0
POULTRY	7	0.0	0.0	0.0	0.0	0.0	0.0
EGGS IN SHELL	8	0.0	0.0	0.0	0.0	0.0	0.0
MILK, CREAM UNP	9	0.0	0.0	0.0	0.0	0.0	0.0
OTH AG PROD	10	0.0	0.0	0.0	0.0	0.0	0.0
FOREST PROD	11	0.0	0.0	0.0	0.0	0.0	0.0
FISHING, H & T	12	0.0	0.0	0.0	0.0	0.0	0.0
COAL	13	0.0	0.0	0.0	0.0	0.0	0.0
CRUDE OIL	14	0.0	0.0	0.0	0.0	0.0	0.0
NATURAL GAS	15	0.0	0.0	0.0	0.0	0.0	0.0
SULPHUR	16	0.0	0.0	0.0	0.0	0.0	0.0
OTH MIN PROD	17	0.0	0.0	0.0	0.0	0.0	0.0
DEFT, PDPR ETC.	18	0.0	0.0	0.0	0.0	0.0	0.0
DAIRY, PROC	19	0.0	0.0	0.0	0.0	0.0	0.0
FEEDS MFR	20	0.0	0.0	0.0	0.0	0.0	0.0301275
VEG OIL PROD	21	0.0	0.0	0.0	0.0	0.0	0.0
FLOUR, CER & B	22	0.0	0.0	0.0	0.0	0.0	0.0
SOFT DRINKS	23	0.0	0.0	0.0	0.0	0.0	0.0
BEERS & ALC	24	0.0	0.0	0.0	0.0	0.0	0.0
OTH FOODS, NES	25	0.0	0.0	0.0	0.0	0.0	0.0
TIRES & TUBES	26	0.0	0.0	0.0	0.0	0.0	0.0
OTH RUBBER PROD	27	0.0006651	0.0007264	0.0	0.0	0.0058780	0.0
LEATHER PROD	28	0.0	0.0	0.0	0.0	0.0	0.0
TEXTILE PROD	29	0.0068455	0.0068023	0.0062837	0.0044736	0.0372964	0.0000918
HOSIERY & KNITTED	30	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING	31	0.0	0.0	0.0	0.0	0.0	0.0
LUMBER & PLYWOOD	32	0.0	0.0	0.0	0.0	0.0	0.0
WOOD PROD NES	33	0.0003543	0.0002875	0.0002686	0.0	0.0006596	0.0
FURNIT & FIX	34	0.0	0.0	0.0	0.0	0.0	0.0
PULP & PAPER	35	0.0	0.0	0.0	0.0	0.0	0.0
PRINTING & PUB	36	0.0	0.0	0.0	0.0	0.0	0.0
IRON & STEEL	37	0.0	0.0	0.0	0.0	0.0	0.0
OTH PRIM METAL	38	0.0	0.0	0.0	0.0	0.0	0.0
METAL FAB PROD	39	0.0001993	0.0001796	0.0006895	0.0	0.0003642	0.0
MACHINERY	40	0.0448001	0.0447122	0.0244083	0.0242891	0.0411955	0.0
VEHICLES & OTH TRANS	41	0.0	0.0	0.0	0.0	0.0	0.0
ELECT APPLIANCES	42	0.0	0.0	0.0	0.0	0.0	0.0
CEMENT	43	0.0	0.0	0.0	0.0	0.0	0.0
OTH NON-MET	44	0.0000220	0.0	0.0	0.0	0.0	0.0
PETROLEUM	45	0.0606162	0.0648765	0.0470153	0.0325877	0.0414120	0.0
FERTILIZERS	46	0.0953473	0.1187543	0.0867761	0.0943233	0.0834636	0.0
CHEMICAL	47	0.0322794	0.0608589	0.0371907	0.0355592	0.0279034	0.0068002
MISC MFR	48	0.0000884	0.0000726	0.0	0.0	0.0001477	0.0
NEW CONSTRUCT	49	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONST	50	0.0117635	0.0127980	0.0094746	0.0057582	0.0099149	0.0022001
TRANSP SERV	51	0.0000442	0.0000358	0.0	0.0	0.0000688	0.0000558
STORAGE SERV	52	0.0	0.0	0.0	0.0	0.0	0.0
COMMUNIC	53	0.0125800	0.0107101	0.0100932	0.0070283	0.0056515	0.0
ELECT POWER	54	0.0146438	0.0124728	0.0119574	0.0108672	0.0117461	0.0202168
GAS PIPE SERV	55	0.0	0.0	0.0	0.0025544	0.0	0.0062489
WATER & OTH	56	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE	57	0.0307695	0.0307695	0.0298751	0.0286238	0.0301674	0.0092102
RETAIL	58	0.0059817	0.0061465	0.0080584	0.0038388	0.0013981	0.0001207
FINANCE & OTH	59	0.0426474	0.0370133	0.0288635	0.0325877	0.0218776	0.0301302
REAL ESTATE	60	0.0693816	0.0696664	0.0743730	0.0798815	0.0638605	0.0016208
EDUCATION	61	0.0	0.0	0.0	0.0	0.0	0.0
HEALTH SERV	62	0.0	0.0	0.0	0.0	0.0	0.0
ACCOM & FOOD	63	0.0	0.0	0.0	0.0	0.0	0.0
BUSINESS SERV	64	0.0040800	0.0040300	0.0047778	0.0034882	0.0085631	0.0102217
PERSONAL SERV	65	0.0025174	0.0024920	0.0007080	0.0070616	0.0110176	0.0080223
NON-COMPETING IMP	66	0.0001352	0.0000918	0.0	0.0	0.0002942	0.0
VALUE ADDED	67	0.4928052	0.4484779	0.5573692	0.5817022	0.5572911	0.2935737
SUM		1.0000076	0.9999962	1.0000000	0.9999990	1.0000076	1.0002174

TABLE C-3 PRODUCTION TECHNOLOGY COEFFICIENTS (CONTINUED)

		POULTRY & EGG PRDRS 7	DAIRY PRDRS 8	OTH AG PRDRS 9	FORESTRY PRDRS 10	FISHING, H & T PRDRS 11	COAL MINING IND 12
WHEAT, UNMILLED	1	0.0	0.0415574	0.0	0.0	0.0	0.0
BARLEY,UNMILLED	2	0.0	0.0563263	0.0	0.0	0.0	0.0
OIL SEEDS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH CEREAL CROPS	4	0.0	0.0398312	0.0	0.0	0.0	0.0
HAY, FORAGE	5	0.0012247	0.1552822	0.0	0.0	0.0	0.0
LIVESTOCK	6	0.0	0.0275295	0.0	0.0000472	0.0000011	0.0000546
POULTRY	7	0.1221677	0.0	0.0	0.0	0.0	0.0
EGGS IN SHELL	8	0.0	0.0	0.0	0.0	0.0	0.0
MILK, CREAM UNP	9	0.0	0.0251262	0.0	0.0	0.0	0.0
OTH AG PROD	10	0.0	0.0	0.1770234	0.0012084	0.0000150	0.0007043
FOREST PROD	11	0.0	0.0	0.0	0.1049121	0.0	0.0
FISHING, H & T	12	0.0	0.0	0.0	0.0000257	0.0134414	0.0000298
COAL	13	0.0	0.0	0.0	0.0	0.0	0.0083022
CRUDE OIL	14	0.0	0.0	0.0083550	0.0	0.0	0.0
NATURAL GAS	15	0.0260256	0.0	0.0	0.0	0.0	0.0
SULPHUR	16	0.0	0.0	0.0	0.0	0.0	0.0
OTH MIN PROD	17	0.0	0.0	0.0	0.0000057	0.0046083	0.0060238
BEEF, PORK ETC.	18	0.0	0.0	0.0	0.0143598	0.0000355	0.0016606
DAIRY, PROC	19	0.0	0.0	0.0	0.0008942	0.0000221	0.0010341
FEEDS MFR	20	0.4424372	0.0595869	0.0	0.0036719	0.0	0.0
VEG OIL PROD	21	0.0	0.0	0.0	0.0	0.0	0.0
FLOUR, CER & B	22	0.0	0.0	0.0	0.0005703	0.0000141	0.0006596
SOFT DRINKS	23	0.0	0.0	0.0	0.0002049	0.0000050	0.0002369
BEERS & ALC	24	0.0	0.0	0.0	0.0006979	0.0000172	0.0008071
OTH FOODS, MES	25	0.0	0.0	0.0	0.0007767	0.0000192	0.0008982
TIRES & TUBES	26	0.0	0.0	0.0	0.0018573	0.0000459	0.0021479
OTH RUBBER PROD	27	0.0000765	0.0	0.0	0.0004601	0.0000113	0.0005320
LEATHER PROD	28	0.0	0.0	0.0	0.0003052	0.0000075	0.0003530
TEXTILE PROD	29	0.0	0.0077360	0.0031331	0.0031110	0.0149908	0.0006513
HOSIERY & KNITTED	30	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING	31	0.0	0.0	0.0	0.0002020	0.0000049	0.0002336
LUMBER & PLYWOOD	32	0.0	0.0	0.0	0.0000444	0.0053773	0.0005083
WOOD PROD NES	33	0.0000765	0.0	0.0070496	0.0004221	0.0000092	0.0005115
FURNIT & FIX	34	0.0	0.0	0.0	0.0	0.0	0.0
PULP & PAPER	35	0.0	0.0	0.0	0.0042835	0.0001059	0.0049538
PRINTING & PUB	36	0.0	0.0	0.0	0.0159234	0.0003937	0.0184150
IRON & STEEL	37	0.0	0.0	0.0	0.0001576	0.0000038	0.0074942
OTH PRIM METAL	38	0.0	0.0	0.0	0.0000501	0.0000012	0.0000580
METAL FAB PROD	39	0.0	0.0015983	0.0002610	0.0128555	0.0043605	0.0063742
MACHINERY	40	0.0039804	0.0091426	0.0135770	0.0168159	0.0002889	0.0375034
VEHICLES & OTH TRANS	41	0.0	0.0	0.0	0.0090510	0.0166620	0.0106269
ELECT APPLIANCES	42	0.0	0.0	0.0	0.0039081	0.0000966	0.0045196
CEMENT	43	0.0	0.0	0.0	0.0	0.0	0.0
OTH NON-MET	44	0.0007654	0.0	0.0005220	0.0006254	0.0000126	0.0005933
PETROLEUM	45	0.0133190	0.0419295	0.0099216	0.0139529	0.0238274	0.0239950
FERTILIZERS	46	0.0	0.0	0.0023000	0.0001117	0.0000027	0.0001292
CHEMICAL	47	0.0094917	0.0327869	0.0023997	0.0059673	0.0074124	0.0055339
MISC MFR	48	0.0	0.0	0.0062663	0.0057167	0.0224147	0.0152181
NEW CONSTRUCT	49	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONST	50	0.0029087	0.0135541	0.0035164	0.0184720	0.0	0.0051032
TRANSP SERV	51	0.0019902	0.0612492	0.0005221	0.0492192	0.0144587	0.0249359
STORAGE SERV	52	0.0	0.0	0.0	0.0003296	0.0000081	0.0003811
COMMUNIC	53	0.0006889	0.0015983	0.0060052	0.0072626	0.0000980	0.0067947
ELECT POWER	54	0.0071187	0.0318278	0.0190600	0.0016111	0.0003840	0.0580394
GAS PIPE SERV	55	0.0045927	0.0039639	0.0013054	0.0001124	0.0	0.0
WATER & OTH	56	0.0	0.0	0.0031331	0.0000374	0.0	0.0012948
WHOLESALE	57	0.0025260	0.0275104	0.0041775	0.0183788	0.0114095	0.0286054
RETAIL	58	0.0002296	0.0067770	0.0054830	0.0055470	0.0062647	0.0108905
FINANCE & OTH	59	0.0080372	0.0338475	0.0070496	0.0450747	0.0046082	0.0433391
REAL ESTATE	60	0.0015309	0.0023655	0.0	0.0	0.0	0.0
EDUCATION	61	0.0	0.0	0.0	0.0	0.0	0.0
HEALTH SERV	62	0.0	0.0	0.0	0.0	0.0	0.0
ACCOM & FOOD	63	0.0	0.0	0.0018276	0.0394557	0.0002338	0.0109353
BUSINESS SERV	64	0.0035211	0.0139248	0.0026109	0.0356369	0.0047296	0.0330696
PERSONAL SERV	65	0.0022963	0.0092832	0.0028720	0.0159842	0.0003811	0.0122967
NON-COMPETING IMP	66	0.0	0.0	0.0647519	0.0001418	0.0000035	0.0001640
VALUE ADDED	67	0.3449938	0.2957277	0.6464751	0.5705408	0.8432187	0.6039195
SUM		0.9999983	1.0000610	0.9999978	0.9999991	0.9999966	1.0000019

TABLE C-3 PRODUCTION TECHNOLOGY COEFFICIENTS (CONTINUED)

		CRUDE OIL & GAS IND 13	OTH MINING IND 14	MEAT PROC IND 15	DAIRY IND 16	FEEDS MFR IND 17	FLOUR CER BAKERY IND 18
WHEAT, UNMILLED	1	0.0	0.0	0.0	0.0	0.0724283	0.2895153
BARLEY,UNMILLED	2	0.0	0.0	0.0	0.0	0.2023788	0.0645759
OIL SEEDS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH CEREAL CROPS	4	0.0	0.0	0.0	0.0	0.0678219	0.0
HAY, FORAGE	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK	6	0.0000086	0.0000564	0.7082907	0.0000161	0.0000088	0.0000156
POULTRY	7	0.0	0.0	0.0267838	0.0	0.0	0.0
EGGS IN SHELL	8	0.0	0.0	0.0	0.0	0.0	0.0028386
MILK, CREAM UNP	9	0.0	0.0	0.0	0.4278435	0.0	0.0010451
OTH AG PROD	10	0.0001111	0.0007273	0.0001052	0.0	0.0	0.0027131
FOREST PROD	11	0.0	0.0	0.0000029	0.0	0.0	0.0
FISHING, H & T	12	0.0000047	0.0000307	0.0000044	0.0000088	0.0000048	0.0000385
COAL	13	0.0	0.0003130	0.0	0.0001069	0.0	0.0
CRUDE OIL	14	0.0	0.0	0.0	0.0	0.0	0.0
NATURAL GAS	15	0.0005129	0.0000247	0.0003311	0.0008023	0.0004693	0.0003587
SULPHUR	16	0.0	0.0	0.0	0.0	0.0	0.0
OTH MIN PROD	17	0.0367829	0.0064498	0.0006515	0.0002827	0.0055082	0.0005790
BEEF, PORK ETC.	18	0.0002620	0.0017149	0.0388016	0.0007721	0.0702688	0.0127996
DAIRY, PROC	19	0.0001631	0.0010679	0.0019786	0.1081125	0.0087729	0.0053663
FEEDS MFR	20	0.0	0.0	0.0002556	0.0	0.0865823	0.0024959
VEG OIL PROD	21	0.0	0.0	0.0	0.0	0.0	0.0
FLOUR, CER & B	22	0.0001040	0.0006811	0.0004994	0.0006096	0.0002009	0.0634602
SOFT DRINKS	23	0.0000373	0.0002447	0.0000354	0.0000701	0.0000384	0.0000679
BEERS & ALC	24	0.0001273	0.0008335	0.0001206	0.0002387	0.0001311	0.0002314
OTH FOODS, MES	25	0.0001417	0.0009276	0.0039944	0.0215141	0.0235609	0.0441385
TIRES & TUBES	26	0.0003399	0.0022181	0.0003210	0.0006354	0.0003488	0.0006159
OTH RUBBER PROD	27	0.0000839	0.0005493	0.0000795	0.0001574	0.0000864	0.0001525
LEATHER PROD	28	0.0000557	0.0003645	0.0000527	0.0001044	0.0000573	0.0001012
TEXTILE PROD	29	0.0001027	0.0	0.0003677	0.0003799	0.0087733	0.0191087
HOSIERY & KNITTED	30	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING	31	0.0000368	0.0002413	0.0000349	0.0000691	0.0000379	0.0000670
LUMBER & PLYWOOD	32	0.0000081	0.0000530	0.0000076	0.0000151	0.0000083	0.0000147
WOOD PROD NES	33	0.0000018	0.0000530	0.0010560	0.0016882	0.0000018	0.0001592
FURNIT & FIX	34	0.0	0.0	0.0	0.0	0.0	0.0
POLP & PAPER	35	0.0007816	0.0070848	0.0105495	0.0545933	0.0075321	0.0342104
PRINTING & PUB	36	0.0029056	0.0190167	0.0027527	0.0054482	0.0029911	0.0052804
IRON & STEEL	37	0.0000287	0.0170784	0.0000272	0.0000539	0.0000296	0.0000522
OTH FERR METAL	38	0.0000091	0.0000599	0.0000086	0.0000304	0.0000094	0.0000166
METAL FAB PROD	39	0.0017368	0.0065992	0.0023387	0.0283895	0.0117994	0.0029040
MACHINERY	40	0.0064903	0.0420395	0.0020196	0.0039973	0.0021945	0.0038741
VEHICLES & OTH TRANS	41	0.0012047	0.0071986	0.0010420	0.0020624	0.0011322	0.0019968
ELECT APPLIANCES	42	0.0007131	0.0046673	0.0006756	0.0013371	0.0007341	0.0012959
CEMENT	43	0.0	0.0	0.0	0.0	0.0	0.0
OTH NON-MET	44	0.0000936	0.0006786	0.0002280	0.0020877	0.0000963	0.0001701
PETROLEUM	45	0.0033863	0.0257828	0.0004276	0.0105184	0.0031716	0.0047023
FERTILIZERS	46	0.0000203	0.0001334	0.0000338	0.0000382	0.0000521	0.0000370
CHEMICAL	47	0.0046527	0.0059265	0.0040354	0.0021941	0.0328297	0.0107600
MISC MFR	48	0.0013575	0.0092989	0.0025363	0.0054479	0.0013867	0.0047971
NEW CONSTRUCT	49	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONST	50	0.0245766	0.0004531	0.0016846	0.0019790	0.0014080	0.0016223
TRANSP SERV	51	0.0046175	0.0485226	0.0138471	0.0264565	0.0922662	0.0717221
STORAGE SERV	52	0.0000601	0.0003936	0.0000569	0.0001127	0.0401128	0.0001092
COMMUNIC	53	0.0039601	0.0106513	0.0036337	0.0036293	0.0036235	0.0045751
ELECT POWER	54	0.0089673	0.0088158	0.0018357	0.0067529	0.0064459	0.0064581
GAS PIPE SERV	55	0.0017101	0.0000498	0.0009352	0.0019255	0.0012516	0.0011599
WATER & OTH	56	0.0004993	0.0000329	0.0-	0.0	0.0000312	0.0000623
WHOLESALE	57	0.0046903	0.0287918	0.0203318	0.0129221	0.0426887	0.0264188
RETAIL	58	0.0009963	0.0090323	0.0013215	0.0028438	0.0015411	0.0030821
FINANCE & OTH	59	0.1739118	0.0347114	0.0022917	0.0066593	0.0047249	0.0135090
REAL ESTATE	60	0.0	0.0	0.0	0.0	0.0	0.0
EDUCATION	61	0.0	0.0	0.0	0.0	0.0	0.0
HEALTH SERV	62	0.0	0.0	0.0	0.0	0.0	0.0
ACCOM & FOOD	63	0.0017254	0.0112926	0.0016346	0.0022353	0.0017762	0.0031356
BUSINESS SERV	64	0.0471986	0.0229774	0.0024816	0.0055320	0.0020492	0.0097395
PERSONAL SERV	65	0.0058936	0.0138864	0.0054674	0.0097132	0.0051795	0.0079370
NON-COMPETING IMP	66	0.0000258	0.0001694	0.0001937	0.0000485	0.0000266	0.0000470
VALUE ADDED	67	0.6588037	0.6474419	0.1329065	0.2383684	0.1854663	0.2695861
SUM		0.9999999	0.9993367	0.9999952	0.9998031	1.0000381	0.9997307

TABLE C-3 PRODUCTION TECHNOLOGY COEFFICIENTS (CONTINUED)

		VEGETABLE OIL MILLS 19	SOFT DRINK MFR IND 20	BEERS, ALC MFR IND 21	OTH FOOD MFR IND 22	RUBBER PROD IND 23	LEATHER PROD IND 24
WHEAT, UNMILLED	1	0.0	0.0	0.0058502	0.0964735	0.0	0.0
BARLEY,UNMILLED	2	0.0	0.0110263	0.1731469	0.0385894	0.0	0.0
OIL SEEDS	3	0.4130454	0.0	0.0	0.0	0.0	0.0
OTH CEREAL CROPS	4	0.0	0.0320671	0.0176407	0.1289895	0.0	0.0
HAY, FORAGE	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK	6	0.0	0.0000496	0.0000489	0.0000278	0.0000244	0.0000220
POULTRY	7	0.0	0.0	0.0	0.0	0.0	0.0
EGGS IN SHELL	8	0.0000914	0.0	0.0	0.0257262	0.0	0.0
MILK, CREAM UNP	9	0.0001829	0.0	0.0	0.0321578	0.0	0.0
OTH AG PROD	10	0.0000914	0.0006401	0.0	0.0	0.0003148	0.0002835
FOREST PROD	11	0.0	0.0	0.0	0.0	0.0	0.0
FISHING, H & T	12	0.0	0.0000271	0.0000266	0.0018050	0.0000133	0.0004784
COAL	13	0.0	0.0	0.0	0.0	0.0000831	0.0002332
CRUDE OIL	14	0.0	0.0	0.0	0.0	0.0	0.0
NATURAL GAS	15	0.0	0.0008574	0.0	0.0024483	0.0003325	0.0002332
SULPHUR	16	0.0	0.0	0.0	0.0000411	0.0	0.0
OTH MIN PROD	17	0.0	0.0000060	0.0001059	0.0026162	0.0014995	0.0002358
BEEF, PORK ETC.	18	0.2147287	0.0060538	0.0014868	0.0027784	0.0010748	0.0461442
DAIRY, PROC	19	0.0004574	0.0009398	0.0009259	0.0052580	0.0004823	0.0004163
FEEDS MFR	20	0.0	0.0	0.0	0.0000617	0.0	0.0
VEG OIL PROD	21	0.0193029	0.0	0.0	0.0	0.0	0.0
FLOUR, CER & B	22	0.0005488	0.0005994	0.0005905	0.0089560	0.0002948	0.0002655
SOFT DRINKS	23	0.0001829	0.0002153	0.0002121	0.0001205	0.0001359	0.0000954
BEERS & ALC	24	0.0	0.0010764	0.0017726	0.0033319	0.0003608	0.0003249
OTH FOODS, MES	25	0.0001829	0.1025628	0.0081325	0.0563781	0.0004015	0.0015276
TIRES & TUBES	26	0.0	0.0019520	0.0019230	0.0010923	0.0009602	0.0008646
OTH RUBBER PROD	27	0.0	0.0004834	0.0004763	0.0002705	0.0133745	0.0492551
LEATHER PROD	28	0.0	0.0003208	0.0003160	0.0001795	0.0031510	0.2109629
TEXTILE PROD	29	0.0042082	0.0005919	0.0005831	0.0024709	0.0637316	0.0277808
HOSIERY & KNITTED	30	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING	31	0.0	0.0002123	0.0002092	0.0001188	0.0006032	0.0040585
LUMBER & PLYWOOD	32	0.0	0.0000466	0.0000459	0.0000261	0.0000229	0.0021194
WOOD PROD MES	33	0.0077760	0.0000962	0.0049605	0.0084413	0.0020066	0.0003374
FURNIT & FIX	34	0.0	0.0	0.0	0.0	0.0	0.0
PULP & PAPER	35	0.0	0.0385442	0.0300124	0.0329899	0.0287381	0.0159867
PRINTING & PUB	36	0.0	0.0167356	0.0164873	0.0093649	0.0089806	0.0081128
IRON & STEEL	37	0.0	0.0001656	0.0001632	0.0001132	0.0004139	0.0007729
OTH PRIM METAL	38	0.0	0.0000527	0.0000519	0.0000499	0.0026034	0.0000233
METAL FAB PROD	39	0.0053974	0.0384631	0.0199076	0.0315519	0.0107483	0.0153924
MACHINERY	40	0.0145457	0.0123644	0.0120955	0.0068709	0.0063724	0.0054393
VEHICLES & OTH TRANS	41	0.0	0.0063351	0.0062411	0.0035450	0.0036150	0.0028962
ELECT APPLIANCES	42	0.0	0.0041074	0.0040465	0.0022984	0.0020204	0.0018134
CEMENT	43	0.0	0.0	0.0	0.0	0.0	0.0
OTH NON-MET	44	0.0004574	0.0376683	0.0264824	0.0040873	0.0035910	0.0004720
PETROLEUM	45	0.0067697	0.0131971	0.0013523	0.0025876	0.0046169	0.0019706
FERTILIZERS	46	0.0	0.0001174	0.0001157	0.0000657	0.0000577	0.0000523
CHEMICAL	47	0.0161009	0.0152426	0.0100098	0.0092618	0.2265887	0.0290040
MISC MFR	48	0.0296404	0.0113247	0.0115193	0.0254178	0.0097734	0.0203852
NEW CONSTRUCT	49	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONST	50	0.0013722	0.0033441	0.0033001	0.0021603	0.0027436	0.0023320
TRANSP SERV	51	0.0298234	0.0242513	0.0222603	0.0549906	0.0234317	0.0175294
STORAGE SERV	52	0.0098801	0.0303215	0.0181644	0.0001838	0.0111706	0.0013194
COMMUNIC	53	0.0013722	0.0083693	0.0072559	0.0048421	0.0086186	0.0076763
ELECT POWER	54	0.0083249	0.0036014	0.0083504	0.0353905	0.0082314	0.0037313
GAS PIPE SERV	55	0.0048485	0.0021837	0.0023501	0.0059048	0.0	0.0
WATER & OTH	56	0.0008233	0.0017149	0.0044502	0.0311521	0.0010809	0.0002332
WHOLESALE	57	0.0196688	0.0347500	0.0261265	0.0353146	0.0299005	0.0317512
RETAIL	58	0.0032933	0.0073505	0.0053451	0.0038885	0.0028516	0.0029680
FINANCE & OTH	59	0.0032933	0.0204939	0.0088504	0.0115422	0.0202876	0.0195895
REAL ESTATE	60	0.0054889	0.0	0.0	0.0	0.0	0.0
EDUCATION	61	0.0	0.0	0.0	0.0	0.0	0.0
HEALTH SERV	62	0.0	0.0	0.0	0.0	0.0	0.0
ACCOM & FOOD	63	0.0026530	0.0099380	0.0097905	0.0055611	0.0048885	0.0044021
BUSINESS SERV	64	0.0086908	0.0207369	0.0098245	0.0113864	0.0103555	0.0192833
PERSONAL SERV	65	0.0043911	0.0093720	0.0042531	0.0118834	0.0119595	0.0114014
NON-COMPETING IMP	66	0.0044826	0.0001491	0.0001468	0.0078811	0.0145407	0.0002992
VALUE ADDED	67	0.3578812	0.4693154	0.5121900	0.2915439	0.4530088	0.4300095
SUM		0.9999969	0.9999935	0.9995965	0.9999971	1.0000000	1.0000000

TABLE C-3 PRODUCTION TECHNOLOGY COEFFICIENTS (CONTINUED)

		TEXTILE PROD IND 25	KNITTING MILL IND 26	CLOTHING IND 27	WOOD PROD IND 28	FURNITURE IND 29	PULP & PAPER IND 30
WHEAT, UNMILLED	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY,UNMILLED	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH CEREAL CROPS	4	0.0	0.0	0.0123862	0.0	0.0	0.0
HAY, FORAGE	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK	6	0.0000181	0.0000132	0.0000368	0.0000223	0.0000154	0.0000201
POULTRY	7	0.0	0.0	0.0	0.0	0.0	0.0
EGGS IN SHELL	8	0.0	0.0	0.0	0.0	0.0	0.0
MILK, CREAM UNP	9	0.0	0.0	0.0	0.0	0.0	0.0
OTH AG PROD	10	0.0002343	0.0001706	0.0	0.0003141	0.0001988	0.0002594
FOREST PROD	11	0.0	0.0	0.0	0.0786956	0.0000594	0.1514355
FISHING, H & T	12	0.0001808	0.0000072	0.0154185	0.0000121	0.0000084	0.0000109
COAL	13	0.0	0.0002163	0.0	0.0000233	0.0000594	0.0
CRUDE OIL	14	0.0	0.0	0.0	0.0	0.0	0.0
NATURAL GAS	15	0.0004274	0.0002163	0.0002742	0.0005606	0.0004759	0.0004110
SULPHUR	16	0.0	0.0	0.0	0.0	0.0	0.0007784
OTH MIN PROD	17	0.0000022	0.0000016	0.0000044	0.0000027	0.0000018	0.0035065
BEEF, PORK ETC.	18	0.0005525	0.0004022	0.0011199	0.0006787	0.0004688	0.0006116
DAIRY, PROC	19	0.0003440	0.0002505	0.0006974	0.0004226	0.0002919	0.0004407
FEEDS MFR	20	0.0	0.0	0.0	0.0	0.0	0.0
VEG OIL PROD	21	0.0	0.0	0.0	0.0	0.0	0.0
FLOUR, CER & B	22	0.0002194	0.0001597	0.0004445	0.0002695	0.0001862	0.0002429
SOFT DRINKS	23	0.0000788	0.0000574	0.0001598	0.0000968	0.0000669	0.0000872
BEERS & ALC	24	0.0002685	0.0001955	0.0005443	0.0003298	0.0002278	0.0002972
OTH FOODS, MFS	25	0.0007262	0.0002175	0.0006059	0.0008459	0.0002535	0.0007688
TIRES & TUBES	26	0.0007146	0.0005203	0.0014486	0.0008778	0.0006063	0.0007991
OTH RUBBER PROD	27	0.0018868	0.0022918	0.0003587	0.0002280	0.0295373	0.0002954
LEATHER PROD	28	0.0031174	0.0009507	0.0002380	0.0001442	0.0005160	0.0001300
TEXTILE PROD	29	0.2602833	0.4232595	0.1180240	0.0017378	0.1540802	0.0044409
HOSIERY & KNITTED	30	0.0	0.0047588	0.0	0.0	0.0	0.0
CLOTHING	31	0.0018730	0.0493752	0.2421839	0.0000955	0.0000659	0.0000863
LUMBER & PLYWOOD	32	0.0000170	0.0000124	0.0000346	0.1447751	0.0565879	0.0003175
WOOD PROD NES	33	0.0000038	0.0000028	0.0000078	0.0906950	0.0074987	0.0027916
FURNIT & FIX	34	0.0000854	0.0	0.0	0.0	0.0117787	0.0
PULP & PAPER	35	0.0073760	0.0141785	0.0422485	0.0072219	0.0113924	0.1371130
PRINTING & PUB	36	0.0061268	0.0061912	0.0124194	0.0075264	0.0051986	0.0087736
IRON & STEEL	37	0.0014284	0.0000441	0.0001229	0.0317446	0.0208723	0.0000671
OTH PRIM METAL	38	0.0000192	0.0000140	0.0000391	0.0004324	0.0022766	0.0007778
METAL FAB PROD	39	0.0040015	0.0015440	0.0045338	0.0674140	0.0611093	0.0093162
MACHINERY	40	0.0044951	0.0032728	0.0093078	0.0055803	0.0038141	0.0045763
VEHICLES & OTH TRANS	41	0.0023192	0.0016886	0.0047012	0.0028490	0.0019679	0.0025675
ELECT APPLIANCES	42	0.0015037	0.0010948	0.0032302	0.0016472	0.0013353	0.0016646
CEMENT	43	0.0	0.0	0.0	0.0	0.0	0.0
OTH NON-MET	44	0.0009668	0.0001437	0.0004001	0.0074953	0.0044505	0.0165048
PETROLEUM	45	0.0016473	0.0017176	0.0017029	0.0100372	0.0018433	0.0167948
FERTILIZERS	46	0.0000430	0.0000313	0.0000871	0.0000528	0.0000364	0.0003476
CHEMICAL	47	0.1703105	0.0127792	0.0056588	0.0081865	0.0624841	0.0550394
MISC MFR	48	0.0368834	0.0048460	0.0134313	0.0248811	0.0614736	0.0249934
NEW CONSTRUCT	49	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONST	50	0.0045310	0.0010815	0.0009403	0.0039709	0.0023200	0.0045793
TRANSP SERV	51	0.0181640	0.0127802	0.0142264	0.0262064	0.0163854	0.0531920
STORAGE SERV	52	0.0001268	0.0000923	0.0002570	0.0001557	0.0001076	0.0001403
COMMUNIC	53	0.0074246	0.0056533	0.0084215	0.0079826	0.0070649	0.0054919
ELECT POWER	54	0.0014533	0.0038935	0.0119112	0.0059564	0.0038072	0.0051168
GAS PIPE SERV	55	0.0012923	0.0	0.0005093	0.0008759	0.0010707	0.0134790
WATER & OTH	56	0.0000854	0.0000652	0.0	0.0	0.0	0.0009158
WHOLESALE	57	0.0410929	0.0123926	0.0182062	0.0427649	0.0531564	0.0182790
RETAIL	58	0.0022167	0.0030954	0.0061512	0.0037633	0.0029984	0.0037877
FINANCE & OTH	59	0.0194921	0.0203331	0.0295823	0.0203454	0.0171326	0.0162863
REAL ESTATE	60	0.0	0.0	0.0	0.0	0.0	0.0
EDUCATION	61	0.0	0.0	0.0	0.0	0.0	0.0
HEALTH SERV	62	0.0	0.0	0.0	0.0	0.0	0.0
ACCOM & FOOD	63	0.0036382	0.0026489	0.0073749	0.0044653	0.0030870	0.0046277
BUSINESS SERV	64	0.0076181	0.0059959	0.0094737	0.0059893	0.0086829	0.0064329
PERSONAL SERV	65	0.0086662	0.0073461	0.0140588	0.0104503	0.0096720	0.0105871
NON-COMPETING IMP	66	0.0000545	0.0000397	0.0001106	0.0000670	0.0004634	0.0000604
VALUE ADDED	67	0.3799975	0.3899880	0.3870874	0.4009071	0.4328126	0.4052957
SUM		0.9999971	1.0004301	1.0001802	1.0000000	1.0000000	0.9999252

TABLE C-3 PRODUCTION TECHNOLOGY COEFFICIENTS (CONTINUED)

		PRINTING & PUBL IND 31	PRIMARY MET IND 32	METAL FAB IND 33	MACHINERY IND 34	TRANSP EQUIP IND 35	ELECTR APPL IND 36
WHEAT, UNMILLED	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY,UNMILLED	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH CEREAL CROPS	4	0.0	0.0	0.0	0.0	0.0	0.0
HAY, FORAGE	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK	6	0.0000252	0.0000162	0.0000184	0.0000195	0.0000204	0.0000153
POULTRY	7	0.0	0.0	0.0	0.0	0.0	0.0
EGGS IN SHELL	8	0.0	0.0	0.0	0.0	0.0	0.0
MILK, CREAM UNP	9	0.0	0.0	0.0	0.0	0.0	0.0
OTH AG PROD	10	0.0003256	0.0002089	0.0002379	0.0002513	0.0002635	0.0001980
FOREST PROD	11	0.0	0.0000338	0.0	0.0	0.0	0.0
FISHING, H & T	12	0.0000913	0.0000088	0.0000100	0.0000106	0.0000111	0.0000083
COAL	13	0.0	0.0	0.0006102	0.0	0.0000615	0.0
CRUDE OIL	14	0.0	0.0	0.0	0.0	0.0	0.0
NATURAL GAS	15	0.0003283	0.0023573	0.0003774	0.0003953	0.0008002	0.0002193
SULPHUR	16	0.0	0.0	0.0	0.0	0.0	0.0
OTH MIN PROD	17	0.0000030	0.2277847	0.0003388	0.0030856	0.0001563	0.0010983
BEEF, PORK ETC.	18	0.0007676	0.0004926	0.0005610	0.0005925	0.0006214	0.0004670
DAIRY, PROC	19	0.0004780	0.0003067	0.0003494	0.0003690	0.0003970	0.0002908
FEEDS MFP	20	0.0	0.0	0.0	0.0	0.0	0.0
VEG OIL PROD	21	0.0	0.0	0.0	0.0	0.0	0.0
FLOUR, CEP & B	22	0.0003089	0.0002068	0.0002228	0.0002353	0.0002468	0.0001854
SOFT DRINKS	23	0.0001095	0.0000703	0.0000801	0.0000845	0.0000886	0.0000666
BEERS & ALC	24	0.0003731	0.0002394	0.0002726	0.0002880	0.0003020	0.0002269
OTH FOODS, MES	25	0.0004152	0.0003115	0.0006910	0.0009925	0.0003361	0.0002526
TIRES & TUBES	26	0.0009929	0.0006372	0.0007257	0.0006734	0.0083449	0.0006040
OTH RUBBER PROD	27	0.0003154	0.0017368	0.0016486	0.0080168	0.0244541	0.0367195
LEATHER PROD	28	0.0001631	0.0001047	0.0001152	0.0001259	0.0001321	0.0000992
TEXTILE PROD	29	0.0064869	0.0007797	0.0006790	0.0009439	0.0117248	0.0018827
HOSIERY & KNITTED	30	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING	31	0.0001080	0.0000693	0.0000789	0.0000833	0.0000874	0.0000657
LUMBER & PLYWOOD	32	0.0000237	0.0000603	0.0035673	0.0001368	0.0358785	0.0002885
WOOD PROD NES	33	0.0001674	0.0017291	0.0007281	0.0013876	0.0002197	0.0006611
FURNIT & FIX	34	0.0	0.0012632	0.0	0.0	0.0123122	0.0004386
PULP & PAPER	35	0.2002604	0.0049435	0.0044892	0.0033489	0.0036082	0.0188830
PRINTING & PUB	36	0.0325380	0.0054629	0.0062523	0.0065712	0.0068312	0.0051786
IRON & STEEL	37	0.0000842	0.1962346	0.2827897	0.0622067	0.0550423	0.0123325
OTH PRIM METAL	38	0.0048225	0.0025324	0.0249820	0.0047642	0.0280628	0.0405338
METAL FAB PROD	39	0.0030856	0.0402739	0.1133270	0.1699208	0.0844463	0.1300341
MACHINERY	40	0.0062458	0.0091625	0.0105631	0.1128577	0.0220468	0.0045507
VEHICLES & OTH TRANS	41	0.0032225	0.0022709	0.0029977	0.0167492	0.0995366	0.0022344
ELECT APPLIANCES	42	0.0020893	0.0013407	0.0052198	0.0444638	0.0324411	0.1979322
CEMENT	43	0.0	0.0	0.0	0.0	0.0	0.0
OTH NON-MET	44	0.0002742	0.0136771	0.0067700	0.0026625	0.0138807	0.0049499
PETROLEUM	45	0.0018016	0.0053248	0.0018241	0.0027506	0.0026229	0.0009490
FERTILIZERS	46	0.0000597	0.0001398	0.0000436	0.0000461	0.0000483	0.0000363
CHEMICAL	47	0.0138614	0.0200402	0.0097295	0.0059688	0.0116655	0.0511453
MISC MFP	48	0.0084311	0.0021529	0.0058776	0.0055215	0.0095843	0.0053704
NEW CONSTRUCT	49	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONST	50	0.0041807	0.0136139	0.0024687	0.0032810	0.0030164	0.0035637
TRANSP SERV	51	0.0195563	0.0326674	0.0156479	0.0185973	0.0218552	0.0240101
STORAGE SERV	52	0.0001762	0.0001130	0.0001287	0.0001360	0.0001426	0.0001071
COMMUNIC	53	0.0279985	0.0056464	0.0076497	0.0094634	0.0090726	0.0110489
ELECT POWER	54	0.0066955	0.0153283	0.0033970	0.0022137	0.0042785	0.0044410
GAS PIPE SERV	55	0.0007413	0.0064742	0.0011629	0.0013045	0.0018160	0.0005482
WATER & OTH	56	0.0	0.0003609	0.0001020	0.0001195	0.0003385	0.0001644
WHOLESALE	57	0.0161164	0.0473121	0.0257342	0.0396172	0.0365411	0.0302896
RETAIL	58	0.0048058	0.0021340	0.0026076	0.0026828	0.0036631	0.0020432
FINANCE & OTH	59	0.0290294	0.0177872	0.0101706	0.0120172	0.0097266	0.0279620
REAL ESTATE	60	0.0	0.0	0.0	0.0	0.0	0.0
EDUCATION	61	0.0	0.0	0.0	0.0	0.0	0.0
HEALTH SERV	62	0.0	0.0	0.0	0.0	0.0	0.0
ACCOM & FOOD	63	0.0050551	0.0032440	0.0038546	0.0039021	0.0040922	0.0030751
BUSINESS SERV	64	0.0289512	0.0162580	0.0164590	0.0096543	0.0076973	0.0113570
PERSONAL SERV	65	0.0064038	0.0087054	0.0014085	0.0123692	0.0103640	0.0107694
NON-COMPETING IMP	66	0.0000758	0.0001952	0.0000860	0.0000585	0.0000613	0.0000461
VALUE ADDED	67	0.5621340	0.2881861	0.4238638	0.4287949	0.4210998	0.3481973
SUM		1.0000000	0.9999984	0.9997626	0.9999976	1.0000000	1.0000000

TABLE C-3 PRODUCTION TECHNOLOGY COEFFICIENTS (CONTINUED)

		CEMENT MFR IND 37	CONCRETE PROD IND 38	READY MIX MFR IND 39	OTH NON-METAL IND 40	PETROLEUM & COAL IND 41	FERTILIZER MFR IND 42
WHEAT, UNMILLED	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY,UNMILLED	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH CEREAL CROPS	4	0.0	0.0	0.0	0.0	0.0	0.0
HAY, FORAGE	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK	6	0.0000346	0.0000305	0.0000319	0.0000204	0.0000146	0.0
POULTRY	7	0.0	0.0	0.0	0.0	0.0	0.0
EGGS IN SHELL	8	0.0	0.0	0.0	0.0	0.0	0.0
MILK, CREAM UNP	9	0.0	0.0	0.0	0.0	0.0	0.0
OTH AG PROD	10	0.0004461	0.0003939	0.0004112	0.0002635	0.0001883	0.0
FOREST PROD	11	0.0	0.0	0.0	0.0	0.0	0.0
FISHING, H & T	12	0.0000188	0.0000166	0.0000174	0.0000111	0.0000079	0.0
COAL	13	0.0000221	0.0	0.0	0.0	0.0010178	0.0
CRUDE OIL	14	0.0	0.0	0.0	0.0	0.5816653	0.0
NATURAL GAS	15	0.0071778	0.0016769	0.0005548	0.0066371	0.0022728	0.1471615
SULPHUR	16	0.0	0.0	0.0	0.0	0.0	0.0653189
OTH MIN PROD	17	0.0260569	0.0575777	0.0854100	0.1946926	0.0001202	0.0156078
BEEF, PORK ETC.	18	0.0010518	0.0009288	0.0009696	0.0006213	0.0004440	0.0
DAIRY, PROC	19	0.0006550	0.0005784	0.0006038	0.0003869	0.0002765	0.0
FEEDS MFR	20	0.0	0.0	0.0	0.0	0.0	0.0
VEG OIL PROD	21	0.0	0.0	0.0	0.0	0.0	0.0
FLOUR, CER & B	22	0.0004178	0.0003689	0.0003851	0.0002467	0.0001763	0.0
SOFT DRINKS	23	0.0001501	0.0001325	0.0001383	0.0000886	0.0000633	0.0
BEERS & ALC	24	0.0005112	0.0004574	0.0004712	0.0003019	0.0002156	0.0
OTH FOODS, MFG	25	0.0017652	0.0005024	0.0005245	0.0003360	0.0002402	0.0025332
TIRES & TUBES	26	0.0013604	0.0012013	0.0012541	0.0008036	0.0005743	0.0
OTH RUBBER PROD	27	0.0003369	0.0041086	0.0003106	0.0001990	0.0001422	0.0006135
LEATHER PROD	28	0.0002235	0.0001974	0.0002061	0.0001320	0.0000943	0.0
TEXTILE PROD	29	0.0016974	0.0003643	0.0004265	0.0002436	0.0001950	0.0000989
HOSIERY & KNITTED	30	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING	31	0.0001480	0.0001307	0.0001364	0.0000874	0.0000624	0.0
LUMBER & PLYWOOD	32	0.0000325	0.0010450	0.0000299	0.0000192	0.0000137	0.0
WOOD PROD NES	33	0.0005832	0.0005145	0.0000067	0.0007417	0.0002749	0.0021770
FURNIT & FIX	34	0.0000664	0.0	0.0	0.0	0.0	0.0
PULP & PAPER	35	0.0507905	0.0056162	0.0031236	0.0792870	0.0049220	0.0466285
PRINTING & PUB	36	0.0118410	0.0102998	0.0107524	0.0068359	0.0042241	0.0095394
IRON & STEEL	37	0.0001754	0.0422280	0.0002913	0.0000682	0.0000487	0.0013853
OTH PRIM METAL	38	0.0003025	0.0021158	0.0000338	0.0000217	0.0000155	0.0000593
METAL FAB PROD	39	0.0063412	0.0428456	0.0042454	0.0208213	0.0226389	0.0121519
MACHINERY	40	0.0085576	0.0075568	0.0080738	0.0050550	0.0036127	0.0
VEHICLES & OTH TRANS	41	0.0044152	0.0038989	0.0041702	0.0026081	0.0055939	0.0
ELECT APPLIANCES	42	0.0041253	0.0025279	0.0026389	0.0016909	0.0012085	0.0
CEMENT	43	0.0016393	0.1130138	0.1683759	0.0	0.0	0.0
OTH NON-MET	44	0.0220422	0.0059215	0.0009012	0.0032219	0.0002074	0.0002770
PETROLEUM	45	0.0046084	0.0047384	0.0176913	0.0054765	0.0043798	0.0227205
FERTILIZERS	46	0.0002147	0.0000723	0.0000754	0.0000483	0.0000345	0.0
CHEMICAL	47	0.0414094	0.0209721	0.0129717	0.0536532	0.0484768	0.0661428
MISC MFR	48	0.0205812	0.0095923	0.0064495	0.0024735	0.0067108	0.0042749
NEW CONSTRUCT	49	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONST	50	0.0068455	0.0075207	0.0058722	0.0132743	0.0215919	0.0158331
TRANSP SERV	51	0.0389245	0.0415463	0.0476038	0.0456689	0.0067911	0.0357432
STORAGE SERV	52	0.0002414	0.0002132	0.0002225	0.0001426	0.0001019	0.0
COMMUNIC	53	0.0092405	0.0097298	0.0064229	0.0041405	0.0025020	0.0114790
ELECT POWER	54	0.0198497	0.0044209	0.0020807	0.0221238	0.0049082	0.0197913
GAS PIPE SERV	55	0.0210461	0.0040144	0.0016172	0.0147492	0.0838300	0.0376036
WATER & OTH	56	0.0004873	0.0	0.0	0.0007374	0.0	0.0009104
WHOLESALE	57	0.0188276	0.0311735	0.0298545	0.0372230	0.0090805	0.0224434
RETAIL	58	0.0039678	0.0042696	0.0053246	0.0028457	0.0015277	0.0032853
FINANCE & OTH	59	0.0208467	0.0106204	0.0147963	0.0199115	0.0234813	0.0195934
REAL ESTATE	60	0.0	0.0	0.0	0.0	0.0	0.0
EDUCATION	61	0.0	0.0	0.0	0.0	0.0	0.0
HEALTH SERV	62	0.0	0.0	0.0	0.0	0.0	0.0
ACCOM & FOOD	63	0.0069263	0.0061163	0.0063850	0.0040914	0.0029240	0.0056603
BUSINESS SERV	64	0.0098458	0.0169487	0.0310603	0.0087627	0.0051376	0.0184305
PERSONAL SERV	65	0.0187337	0.0158684	0.0255740	0.0125688	0.0055750	0.0052195
NON-COMPETING IMP	66	0.0001039	0.0000917	0.0000957	0.0000613	0.0000438	0.0
VALUE ADDED	67	0.6043727	0.5059502	0.5222971	0.4275494	0.1414026	0.4072566
SUM		0.9999983	1.0000038	0.9999986	0.9999975	0.9999857	0.9999992

TABLE C-3 PRODUCTION TECHNOLOGY COEFFICIENTS (CONTINUED)

PAGE

		CHEMICAL & REL IND 43	MISC MFR IND 44	NEW CONSTR IND 45	REPAIR CONSTR IND 46	TRANSP SERV IND 47	STORAGE SERV IND 48
WHEAT, UNMILLED	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY, UNMILLED	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH.CEREAL CROPS	4	0.0	0.0	0.0	0.0	0.0	0.0
HAY, FORAGE	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK	6	0.0000332	0.0000244	0.0000066	0.0000068	0.0000126	0.0000383
POULTRY	7	0.0	0.0	0.0	0.0	0.0	0.0
EGGS IN SHELL	8	0.0	0.0	0.0001158	0.0000446	0.0	0.0
MILK, CREAM UNP	9	0.0	0.0	0.0001250	0.0000515	0.0	0.0
OTH AG PROD	10	0.0003329	0.0003151	0.0002036	0.0000481	0.0001632	0.0005121
FOREST PROD	11	0.0	0.0	0.0013005	0.0	0.0	0.0
FISHING, H & T	12	0.0	0.0000133	0.0000033	0.0	0.0000069	0.0000216
COAL	13	0.0002663	0.0	0.0005538	0.0	0.0	0.0
CRUDE OIL	14	0.0	0.0	0.0	0.0	0.0	0.0
NATURAL GAS	15	0.0052601	0.0005406	0.0	0.0	0.0	0.0001657
SULPHUR	16	0.0002330	0.0	0.0	0.0	0.0	0.0
OTH MIN PROD	17	0.0012651	0.0012193	0.0101132	0.0	0.0000667	0.0000348
BEEF, PORK ETC.	18	0.0007990	0.0009456	0.0001970	0.0002028	0.0003848	0.0012075
DAIRY, PROC	19	0.0005326	0.0004626	0.0001225	0.0001375	0.0002396	0.0007520
FEEDS MFR	20	0.0	0.0	0.0	0.0000241	0.0	0.0
VEG OIL PROD	21	0.0	0.0	0.0	0.0001121	0.0	0.0
FLOUR, CER & B	22	0.0017644	0.0002951	0.0000786	0.0001822	0.0001528	0.0004796
SOFT DRINKS	23	0.0000998	0.0001060	0.0000281	0.0000423	0.0000549	0.0001723
BEERS & ALC	24	0.0003995	0.0003611	0.0000960	0.0000435	0.0001870	0.0005869
OTH FOODS, MFG	25	0.0018976	0.0004693	0.0001067	0.0000618	0.0002681	0.0006531
TIRES & TUBES	26	0.0010653	0.0010284	0.0017111	0.0040237	0.0002486	0.0015618
OTH RUBBER PROD	27	0.0003662	0.0012517	0.0026267	0.0034562	0.0009648	0.0033868
LEATHER PROD	28	0.0001664	0.0009688	0.0000860	0.0	0.0000817	0.0002566
TEXTILE PROD	29	0.0013649	0.0084687	0.0045796	0.0	0.0001509	0.0053139
HOSIERY & KNITTED	30	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING	31	0.0000998	0.0001045	0.0000281	0.0	0.0000541	0.0001699
LUMBER & PLYWOOD	32	0.0000332	0.0010366	0.0275773	0.1068191	0.0000119	0.0000373
WOOD PROD NES	33	0.0025635	0.0071687	0.0211374	0.0	0.0000026	0.0000084
FURNIT & FIX	34	0.0	0.0000675	0.0013212	0.0	0.0	0.0
PULP & PAPER	35	0.1331690	0.0276944	0.0070963	0.0	0.0011479	0.0119399
PRINTING & PUB	36	0.0090554	0.0084415	0.0021863	0.0	0.0041099	0.0133906
IRON & STEEL	37	0.0000998	0.0119758	0.0751239	0.1058204	0.0000422	0.0001325
OTH PRIM METAL	38	0.0000332	0.0105009	0.0045026	0.0661377	0.0000134	0.0000421
METAL FAB PROD	39	0.0108865	0.0054279	0.1026052	0.0925928	0.0014770	0.0046350
MACHINERY	40	0.0066251	0.0067265	0.0194436	0.1141891	0.0031307	0.0098245
VEHICLES & OTH TRANS	41	0.0033958	0.0031187	0.0023933	0.0	0.0117109	0.0056689
ELECT APPLIANCES	42	0.0022971	0.0161464	0.0367440	0.0	0.0044341	0.0032864
CEMENT	43	0.0	0.0	0.0050158	0.0170936	0.0	0.0
OTH NON-MET	44	0.0005659	0.0152684	0.0548765	0.1424703	0.0005933	0.0004314
PETROLEUM	45	0.0052934	0.0028088	0.0145958	0.0269626	0.0307424	0.0100928
FERTILIZERS	46	0.0044944	0.0000578	0.0000157	0.0	0.0000299	0.0000939
CHEMICAL	47	0.2014182	0.1385370	0.0070598	0.0132130	0.0021695	0.0039469
MISC MFR	48	0.0052601	0.0514135	0.0123606	0.0338547	0.0017924	0.0093825
NEW CONSTRUCT	49	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONST	50	0.0059260	0.0027708	0.0005364	0.0	0.0123102	0.0471106
TRANSP SERV	51	0.0389852	0.0139447	0.0243693	0.0429546	0.0200978	0.0612750
STORAGE SERV	52	0.0001997	0.0001705	0.0000455	0.0011485	0.0000883	0.0002771
COMMUNIC	53	0.0100209	0.0092828	0.0016358	0.0024623	0.0060779	0.0142423
ELECT POWER	54	0.0078236	0.0050685	0.0004735	0.0	0.0115938	0.0093823
GAS PIPE SERV	55	0.0115524	0.0012164	0.0000857	0.0	0.0	0.0007625
WATER & OTH	56	0.0002996	0.0007433	0.0000206	0.0	0.0004559	0.0011603
WHOLESALE	57	0.0260012	0.0265216	0.0426183	0.0510616	0.0209991	0.0189604
RETAIL	58	0.0029963	0.0031969	0.0120658	0.0223645	0.0104895	0.0072470
FINANCE & OTH	59	0.0266338	0.0173008	0.0121627	0.0	0.0070995	0.0400159
REAL ESTATE	60	0.0	0.0	0.0	0.0	0.0	0.0
EDUCATION	61	0.0	0.0	0.0	0.0	0.0	0.0
HEALTH SERV	62	0.0	0.0	0.0	0.0	0.0	0.0
ACCOM & FOOD	63	0.0053600	0.0048924	0.0012980	0.0	0.0025339	0.0079516
BUSINESS SERV	64	0.0095881	0.0070697	0.0257503	0.0	0.0074389	0.0139446
PERSONAL SERV	65	0.0119519	0.0115567	0.0135005	0.0	0.0074521	0.0242335
NON-COMPETING IMP	66	0.0000665	0.0000734	0.0000198	0.0	0.0000380	0.0001193
VALUE ADDED	67	0.4414885	0.5330249	0.8499618	0.1524176	0.8170598	0.6686708
SUM		1.0000296	0.9997916	1.0000000	0.9999993	1.0000582	1.0002975

TABLE C-3 PRODUCTION TECHNOLOGY COEFFICIENTS (CONTINUED)

		COMMUNIC SERV IND 49	ELECTRICAL POWER 50	GAS DISTRB IND 51	WATER & OTH IND 52	WHOLESALE TRADE 53	RETAIL TRADE 54
WHEAT, UNMILLED	1	0.0	0.0	0.0	0.0	0.0006616	0.0
BARLEY,UNMILLED	2	0.0	0.0	0.0	0.0	0.0002008	0.0
OIL SEEDS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH CEREAL CROPS	4	0.0	0.0	0.0	0.0	0.0	0.0
HAY, FORAGE	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK	6	0.0000124	0.0000044	0.0000118	0.0000373	0.0000335	0.0540297
POULTRY	7	0.0	0.0	0.0	0.0	0.0	0.0
EGGS IN SHELL	8	0.0	0.0	0.0	0.0	0.0	0.0
MILK, CREAM UNP	9	0.0	0.0	0.0	0.0	0.0	0.0
OTH AG PROD	10	0.0001599	0.0000573	0.0001528	0.0004812	0.0005217	0.0004230
FOREST PROD	11	0.0	0.0	0.0	0.0	0.0	0.0
FISHING, H & T	12	0.0001845	0.0000028	0.0000084	0.0000203	0.0000182	0.0000179
COAL	13	0.0	0.0782784	0.0	0.0	0.0000336	0.0
CRUDE OIL	14	0.0	0.0	0.0	0.0	0.0	0.0
NATURAL GAS	15	0.0000322	0.0399678	0.0	0.0	0.0003197	0.0014854
SULPHUR	16	0.0	0.0	0.0	0.0	0.0	0.0
OTH MIN PROD	17	0.0000015	0.0000005	0.0000018	0.0000045	0.0000208	0.0000039
BEEF, PORK ETC.	18	0.0003771	0.0001351	0.0003603	0.0011347	0.0010680	0.0021177
DAIRY, PROC	19	0.0002348	0.0000841	0.0002244	0.0007066	0.0006337	0.0006211
FEEDS MFR	20	0.0	0.0	0.0	0.0	0.0	0.0
VEG OIL PROD	21	0.0	0.0	0.0	0.0	0.0	0.0
FLOUR, CER & B	22	0.0001498	0.0000536	0.0001431	0.0004507	0.0005556	0.0003961
SOFT DRINKS	23	0.0000538	0.0000192	0.0000514	0.0001619	0.0001452	0.0001423
BEERS & ALC	24	0.0001833	0.0000657	0.0001751	0.0005514	0.0004945	0.0004847
OTH FOODS, MES	25	0.0002040	0.0000731	0.0001949	0.0006137	0.0005840	0.0005395
TIRES & TUBES	26	0.0004878	0.0001748	0.0004661	0.0014676	0.0013162	0.0017210
OTH RUBBER PROD	27	0.0001208	0.0000433	0.0001154	0.0003635	0.0003260	0.0009505
LEATHER PROD	28	0.0000801	0.0000287	0.0000766	0.0002412	0.0003509	0.0002120
TEXTILE PROD	29	0.0006391	0.0000530	0.0001413	0.0004550	0.0024522	0.0061017
HOSIERY & KNITTED	30	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING	31	0.0000530	0.0000190	0.0000507	0.0001596	0.0001431	0.0024858
LUMBER & PLYWOOD	32	0.0000116	0.0000041	0.0000111	0.0000350	0.0019667	0.0000308
WOOD PROD MES	33	0.0000026	0.0000009	0.0000025	0.0000079	0.0018563	0.0011641
FURNIT & FIX	34	0.0	0.0	0.0	0.0	0.0	0.0
PULP & PAPER	35	0.0011250	0.0004032	0.0010750	0.0033848	0.0109622	0.0182895
PRINTING & PUB	36	0.0112451	0.0021143	0.0039962	0.0125825	0.0131185	0.0121729
IRON & STEEL	37	0.0000414	0.0000148	0.0000395	0.0001245	0.0005829	0.0001094
OTH PRIM METAL	38	0.0000131	0.0000047	0.0000125	0.0000396	0.0002037	0.0000348
METAL FAB PROD	39	0.0014476	0.0005188	0.0013832	0.0043553	0.0086349	0.0068011
MACHINERY	40	0.0030846	0.0010998	0.0029315	0.0092316	0.0082791	0.0081148
VEHICLES & OTH TRANS	41	0.0015831	0.0005674	0.0015127	0.0047630	0.0042715	0.0041868
ELECT APPLIANCES	42	0.0194205	0.0003679	0.0009807	0.0030881	0.0028031	0.0027145
CEMENT	43	0.0	0.0	0.0	0.0	0.0	0.0
OTH NON-MET	44	0.0001347	0.0000482	0.0001287	0.0004054	0.0005991	0.0005693
PETROLEUM	45	0.0015679	0.0039576	0.0014677	0.1393765	0.0111510	0.0059976
FERTILIZERS	46	0.0000293	0.0000105	0.0000280	0.0000883	0.0000792	0.0000776
CHEMICAL	47	0.0017481	0.0004418	0.0011776	0.0037057	0.0048911	0.0038619
MISC MFR	48	0.0024516	0.0005381	0.0014346	0.0045173	0.0067101	0.0049766
NEW CONSTRUCT	49	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONST	50	0.0285093	0.0418830	0.0263847	0.0982776	0.0010770	0.0055358
TRANSP SERV	51	0.0467702	0.0121263	0.0025614	0.0120351	0.0196294	0.0205543
STORAGE SERV	52	0.0000862	0.0000310	0.0000827	0.0002604	0.0204287	0.0102289
COMMUNIC	53	0.0386270	0.0039794	0.0068451	0.0061729	0.0234533	0.0288799
ELECT POWER	54	0.0026334	0.0005907	0.0036989	0.0111448	0.0049646	0.0172501
GAS PIPE SERV	55	0.0001449	0.0433353	0.0	0.0	0.0	0.0052318
WATER & OTH	56	0.0000724	0.0	0.0000524	0.0010131	0.0006731	0.0003436
WHOLESALE	57	0.0045492	0.0039064	0.0030579	0.0401280	0.0111068	0.0058628
RETAIL	58	0.0121841	0.0077817	0.0014851	0.0301926	0.0058932	0.0054426
FINANCE & OTH	59	0.0271321	0.0291076	0.0249740	0.0050658	0.0521204	0.0770760
REAL ESTATE	60	0.0	0.0	0.0	0.0	0.0	0.0
EDUCATION	61	0.0	0.0	0.0	0.0	0.0	0.0
HEALTH SERV	62	0.0	0.0	0.0	0.0	0.0	0.0
ACCOM & FOOD	63	0.0024835	0.0008901	0.0023730	0.0074718	0.0067008	0.0065679
BUSINESS SERV	64	0.0266401	0.0041916	0.0091816	0.1221189	0.0221788	0.0124994
PERSONAL SERV	65	0.0100071	0.0039248	0.0076457	0.0996159	0.0202461	0.0161912
NON-COMPETING IMP	66	0.0000372	0.0000133	0.0000356	0.0001121	0.0002014	0.0004596
VALUE ADDED	67	0.7534186	0.7190839	0.8912660	0.3738418	0.7252547	0.6470728
SUM		1.0001755	0.9999966	0.9999980	1.0000055	0.9996959	0.9999939

TABLE C-3 PRODUCTION TECHNOLOGY COEFFICIENTS (CONTINUED)

		FINANCE 55	REAL ESTATE RNTL 56	EDUCATION & RELATED 57	HOSPITAL & HEALTH 58	ACCOM & FOOD SERV 59	BUSINESS SERV IND 60
WHEAT, UNMILLED	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY,UNMILLED	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH CEREAL CROPS	4	0.0	0.0	0.0	0.0	0.0	0.0
HAY, FORAGE	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK	6	0.0000146	0.0000150	0.0000829	0.0000194	0.0000129	0.0000268
POULTRY	7	0.0	0.0	0.0	0.0	0.0094081	0.0
EGGS IN SHELL	8	0.0	0.0000870	0.0	0.0	0.0057494	0.0
MILK, CREAM UNP	9	0.0	0.0001020	0.0	0.0	0.0	0.0
OTH AG PROD	10	0.0001886	0.0000960	0.0011974	0.0002505	0.0073640	0.0003462
FOREST PROD	11	0.0	0.0	0.0	0.0	0.0	0.0
FISHING, H & T	12	0.0000079	0.0	0.0000452	0.0000106	0.0033782	0.0000146
COAL	13	0.0	0.0	0.0	0.0	0.0	0.0
CRUDE OIL	14	0.0	0.0	0.0	0.0	0.0	0.0
NATURAL GAS	15	0.0003443	0.0	0.0072126	0.0000598	0.0003292	0.0
SULPHUR	16	0.0	0.0	0.0	0.0	0.0	0.0
OTH MIN PROD	17	0.0000017	0.0	0.0000100	0.0005855	0.0001269	0.0000032
BEEF, PORK ETC.	18	0.0004447	0.0002870	0.0025197	0.0005907	0.1017032	0.0008163
DAIRY, PROC	19	0.0002769	0.0002610	0.0015691	0.0003678	0.0247165	0.0005083
FEEDS MFR	20	0.0	0.0000450	0.0	0.0	0.0	0.0
VEG OIL PROD	21	0.0	0.0002100	0.0	0.0	0.0	0.0
FLOUR, CER & B	22	0.0001766	0.0003420	0.0010008	0.0002346	0.0232688	0.0003242
SOFT DRINKS	23	0.0000534	0.0002670	0.0003595	0.0000843	0.0038298	0.0001165
BEERS & ALC	24	0.0002161	0.0002100	0.0012246	0.0002871	0.0061912	0.0003967
OTH FOODS, MFG	25	0.0002405	0.0001200	0.0013629	0.0003195	0.0261990	0.0004415
TIRES & TUBES	26	0.0005751	0.0	0.0032590	0.0007640	0.0005089	0.0013558
OTH RUBBER PROD	27	0.0001424	0.0007440	0.0008072	0.0003385	0.0061260	0.0002873
LEATHER PROD	28	0.0000945	0.0	0.0005356	0.0001255	0.0000836	0.0001735
TEXTILE PROD	29	0.0001744	0.0017341	0.0011169	0.0071414	0.0095937	0.0003889
HOSIERY & KNITTED	30	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING	31	0.0000625	0.0	0.0003545	0.0000831	0.0006406	0.0001148
LUMBER & PLYWOOD	32	0.0000137	0.0056913	0.0000779	0.0000182	0.0000121	0.0001112
WOOD PROD NES	33	0.0000031	0.0	0.0000175	0.0000041	0.0000027	0.0000056
FURNIT & FIX	34	0.0	0.0	0.0001287	0.0	0.0003345	0.0
PULP & PAPER	35	0.0013265	0.0	0.0084179	0.0017621	0.0098167	0.0034504
PRINTING & PUB	36	0.0060090	0.0	0.0343448	0.0065504	0.0043632	0.0100545
IRON & STEEL	37	0.0000488	0.0	0.0002765	0.0000648	0.0000431	0.0000995
OTH PRIM METAL	38	0.0000155	0.0	0.0000881	0.0000206	0.0000137	0.0000285
METAL FAB PROD	39	0.0017069	0.0024271	0.0096715	0.0022673	0.0016409	0.0031334
MACHINERY	40	0.0036180	0.0082834	0.0204999	0.0048059	0.0032273	0.0066417
VEHICLES & OTH TRANS	41	0.0018667	0.0	0.0105768	0.0024796	0.0016516	0.0034267
ELECT APPLIANCES	42	0.0012103	0.0	0.0084030	0.0016076	0.0010706	0.0022217
CEMENT	43	0.0	0.0002730	0.0	0.0	0.0	0.0
OTH NON-MET	44	0.0001588	0.0	0.0009002	0.0003755	0.0022416	0.0002916
PETROLEUM	45	0.0007735	0.0011940	0.0074572	0.0038285	0.0024569	0.0019272
FERTILIZERS	46	0.0000346	0.0	0.0001961	0.0000459	0.0000619	0.0000835
CHEMICAL	47	0.0014535	0.0022561	0.0082356	0.0018974	0.0016989	0.0026682
MISC MFR	48	0.0017704	0.0057063	0.0191758	0.0234845	0.0030455	0.0036714
NEW CONSTRUCT	49	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONST	50	0.0672865	0.0704562	0.0	0.0	0.0059375	0.0
TRANSP SERV	51	0.0032142	0.0063393	0.0403948	0.0059803	0.0117633	0.0068614
STORAGE SERV	52	0.0001020	0.0103467	0.0005783	0.0001355	0.0200129	0.0023554
COMMUNIC	53	0.0117061	0.0055683	0.0121100	0.0406674	0.0065170	0.0175426
ELECT POWER	54	0.0019561	0.0028531	0.0055363	0.0016631	0.0037769	0.0012130
GAS PIPE SERV	55	0.0014922	0.0019171	0.0051519	0.0002692	0.0014059	0.0
WATER & OTH	56	0.0002875	0.0004740	0.0	0.0000448	0.0002456	0.0000172
WHOLESALE	57	0.0046208	0.0045542	0.0137423	0.0198346	0.0187039	0.0080457
RETAIL	58	0.0016804	0.0024061	0.0095802	0.0035299	0.0076751	0.0035444
FINANCE & OTH	59	0.0588908	0.0559320	0.0148119	0.0489373	0.0319876	0.0329513
REAL ESTATE	60	0.0	0.0062523	0.0	0.0	0.0	0.0
EDUCATION	61	0.0	0.0	0.0002489	0.0000583	0.0	0.0
HEALTH SERV	62	0.0	0.0	0.0	0.0	0.0	0.0000806
ACCOM & FOOD	63	0.0029283	0.0057093	0.0165920	0.0038898	0.0025910	0.0053756
BUSINESS SERV	64	0.0096591	0.0278715	0.0160277	0.0237169	0.0157674	0.0287496
PERSONAL SERV	65	0.0128566	0.0055143	0.0125839	0.0171897	0.0066711	0.0235345
NON-COMPETING IMP	66	0.0000439	0.0031051	0.0	0.0	0.0000388	0.0
VALUE ADDED	67	0.8042286	0.7602482	0.6815150	0.7535596	0.6177918	0.8269259
SUM		0.9999861	0.9999985	0.9999999	0.9999979	0.9999999	1.0000000

TABLE C-3 PRODUCTION TECHNOLOGY COEFFICIENTS (CONTINUED) PAGE

		PERSONAL SERV IND 61
WHEAT, UNHILLED	1	0.0
BARLEY,UNHILLED	2	0.0
OIL SEEDS	3	0.0
OTH CEREAL CROPS	4	0.0
HAY, FORAGE	5	0.0
LIVESTOCK	6	0.0000315
POULTRY	7	0.0
EGGS IN SHELL	8	0.0
MILK, CREAM UNP	9	0.0
OTH AG PROD	10	0.0012550
FOREST PROD	11	0.0
FISHING, H & T	12	0.0000172
COAL	13	0.0
CRUDE OIL	14	0.0
NATURAL GAS	15	0.0000440
SULPHUR	16	0.0
OTH MIN PROD	17	0.0000258
BEEF, PORK ETC.	18	0.0009581
DAIRY, PROC	19	0.0005966
FEEDS MFR	20	0.0000881
VEG OIL PROD	21	0.0
FLOUR, CER & B	22	0.0003805
SOFT DRINKS	23	0.0001367
BEERS & ALC	24	0.0004656
OTH FOODS, NES	25	0.0005182
TIRES & TUBES	26	0.0012393
OTH RUBBER PROD	27	0.0018278
LEATHER PROD	28	0.0018016
TEXTILE PROD	29	0.0112432
HOSIERY & KNITTED	30	0.0
CLOTHING	31	0.0001348
LUMBER & PLYWOOD	32	0.0000296
WOOD PROD NES	33	0.0094852
FURNIT & FIX	34	0.0
PULP & PAPER	35	0.0055364
PRINTING & PUB	36	0.0110989
IRON & STEEL	37	0.0001051
OTH PRIM METAL	38	0.0000334
METAL FAB PROD	39	0.0083839
MACHINERY	40	0.0077954
VEHICLES & OTH TRANS	41	0.0040220
ELECT APPLIANCES	42	0.0026077
CEMENT	43	0.0
OTH NON-MET	44	0.0005957
PETROLEUM	45	0.0083763
FERTILIZERS	46	0.0000965
CHEMICAL	47	0.0371006
MISC MFR	48	0.0107581
NEW CONSTRUCT	49	0.0
REPAIR CONST	50	0.0038686
TRANSP SERV	51	0.0134418
STORAGE SERV	52	0.0002199
COMMUNIC	53	0.0096667
ELECT POWER	54	0.0095448
GAS PIPE SERV	55	0.0001653
WATER & OTH	56	0.0001322
WHOLESALE	57	0.0183077
RETAIL	58	0.0054665
FINANCE & OTH	59	0.0732503
REAL ESTATE	60	0.0
EDUCATION	61	0.0
HEALTH SERV	62	0.0000946
ACCOM & FOOD	63	0.0063094
BUSINESS SERV	64	0.0169008
PERSONAL SERV	65	0.0524756
NON-COMPETING IMP	66	0.0
VALUE ADDED	67	0.6633661
SUM		0.9999986

TABLE C-8 PRODUCTION TECHNOLOGY MATRIX
(IN THOUSANDS OF 1972 DOLLARS)

PAGE

		WHEAT PRODUCERS	BARLEY PRDRS	OIL SEEDS PRDRS	OTH GRAIN PRDRS	FORAGE PRDRS	LIVESTOCK PRDRS
		1	2	3	4	5	6
WHEAT, UNMILLED	1	4742.	0.	0.	0.	0.	0.
BARLEY,UNMILLED	2	0.	6738.	0.	0.	0.	15032.
OIL SEEDS	3	0.	0.	1533.	0.	0.	0.
OTH CEREAL CROPS	4	0.	0.	0.	2938.	1895.	18955.
HAY, FORAGE	5	0.	0.	0.	0.	0.	43608.
LIVESTOCK	6	0.	0.	0.	0.	0.	0.
POULTRY	7	0.	0.	0.	0.	0.	0.
EGGS IN SHELL	8	0.	0.	0.	0.	0.	0.
MILK, CREAM UNP	9	0.	0.	0.	0.	0.	0.
OTH AG PROD	10	0.	0.	0.	0.	0.	0.
FOREST PROD	11	0.	0.	0.	0.	0.	0.
FISHING, H & T	12	0.	0.	0.	0.	0.	0.
COAL	13	0.	0.	0.	0.	0.	0.
CRUDE OIL	14	0.	0.	0.	0.	0.	0.
NATURAL GAS	15	0.	0.	0.	0.	0.	0.
SULPHUR	16	0.	0.	0.	0.	0.	0.
OTH MIN PROD	17	0.	0.	0.	0.	0.	0.
BEEF, PORK ETC.	18	0.	0.	0.	0.	0.	0.
DAIRY, PROC	19	0.	0.	0.	0.	0.	0.
FEEDS MFR	20	0.	0.	0.	0.	0.	4020.
VEG OIL PROD	21	0.	0.	0.	0.	0.	0.
FLOUR, CER & B	22	0.	0.	0.	0.	0.	0.
SOFT DRINKS	23	0.	0.	0.	0.	0.	0.
BEERS & ALC	24	0.	0.	0.	0.	0.	0.
OTH FOODS, NES	25	0.	0.	0.	0.	0.	0.
TIRES & TUBES	26	0.	0.	0.	0.	0.	0.
OTH RUBBER PROD	27	44.	72.	0.	0.	280.	0.
LEATHER PROD	28	0.	0.	0.	0.	0.	0.
TEXTILE PROD	29	454.	674.	154.	290.	1779.	12.
HOSIERY & KNITTED	30	0.	0.	0.	0.	0.	0.
CLOTHING	31	0.	0.	0.	0.	0.	0.
LUMBER & PLYWOOD	32	0.	0.	0.	0.	0.	0.
WOOD PROD NES	33	24.	28.	7.	0.	31.	0.
FURNIT & FIX	34	0.	0.	0.	0.	0.	0.
PULP & PAPER	35	0.	0.	0.	0.	0.	0.
PRINTING & PUB	36	0.	0.	0.	0.	0.	0.
IRON & STEEL	37	0.	0.	0.	0.	0.	0.
OTH PRIM METAL	38	0.	0.	0.	0.	0.	0.
METAL FAB PROD	39	13.	18.	2.	0.	17.	0.
MACHINERY	40	2972.	4429.	599.	1573.	1966.	0.
VEHICLES & OTH TRANS	41	0.	0.	0.	0.	0.	0.
ELECT APPLIANCES	42	0.	0.	0.	0.	0.	0.
CEMENT	43	0.	0.	0.	0.	0.	0.
OTH NON-MET	44	1.	0.	0.	0.	0.	0.
PETROLEUM	45	4021.	6826.	1154.	2110.	1976.	0.
FERTILIZERS	46	6325.	11762.	2131.	6108.	3983.	0.
CHEMICAL	47	2141.	6028.	913.	2303.	1331.	907.
MISC MFR	48	6.	7.	0.	0.	7.	0.
NEW CONSTRUCT	49	0.	0.	0.	0.	0.	0.
REPAIR CONST	50	789.	1267.	233.	373.	473.	294.
TRANSP SERV	51	3.	4.	0.	0.	3.	7.
STORAGE SERV	52	0.	0.	0.	0.	0.	0.
COMMUNIC	53	832.	1061.	248.	455.	270.	0.
ELECT POWER	54	971.	1235.	294.	704.	560.	2698.
GAS PIPE SERV	55	0.	0.	0.	165.	0.	834.
WATER & OTH	56	0.	0.	0.	0.	0.	0.
WHOLESALE	57	2041.	3048.	734.	1854.	1439.	1229.
RETAIL	58	397.	609.	198.	249.	67.	16.
FINANCE & OTH	59	2829.	3666.	709.	2110.	1044.	4017.
REAL ESTATE	60	4603.	6900.	1826.	5173.	3048.	216.
EDUCATION	61	0.	0.	0.	0.	0.	0.
HEALTH SERV	62	0.	0.	0.	0.	0.	0.
ACCOM & FOOD	63	0.	0.	0.	0.	0.	0.
BUSINESS SERV	64	271.	399.	117.	226.	409.	1364.
PERSONAL SERV	65	167.	247.	77.	457.	526.	1070.
NON-COMPETING IMP	66	9.	9.	0.	0.	14.	0.
VALUE ADDED	67	32692.	44420.	13686.	37670.	26589.	39187.
SUP		66338.	99046.	24555.	64759.	47712.	133467.

TABLE C-a PRODUCTION TECHNOLOGY MATRIX (CONTINUED)
(IN THOUSANDS OF 1972 DOLLARS)

PAGE

		POULTRY & EGG PRDPS	DAIRY PRDPS	OTH AG PRDPS	FORESTRY PRDTS	FISHING, H & T PRDPS	COAL MINING IND
		7	8	9	10	11	12
WHEAT, UNMILLED	1	0.	927.	0.	0.	0.	0.
BARLEY,UNMILLED	2	0.	1256.	0.	0.	0.	0.
OIL SEEDS	3	0.	0.	0.	0.	0.	0.
OTH CEREAL CROPS	4	0.	888.	0.	0.	0.	0.
HAY, FORAGE	5	21.	3463.	0.	0.	0.	0.
LIVESTOCK	6	0.	614.	0.	0.	0.	0.
POULTRY	7	2101.	0.	0.	0.	0.	1.
EGGS IN SHELL	8	0.	0.	0.	0.	0.	0.
MILK, CREAM UNP	9	0.	560.	0.	0.	0.	0.
OTH AG PROD	10	0.	0.	1875.	5.	0.	0.
FOREST PROD	11	0.	0.	0.	428.	0.	8.
FISHING, H & T	12	0.	0.	0.	0.	35.	0.
COAL	13	0.	0.	0.	0.	0.	69.
CRUDE OIL	14	0.	0.	88.	0.	0.	0.
NATURAL GAS	15	448.	0.	0.	0.	0.	0.
SULPHUR	16	0.	0.	0.	0.	0.	0.
OTH MIN PROD	17	0.	0.	0.	0.	12.	64.
BEEF, PORK ETC.	18	0.	0.	0.	59.	0.	18.
DAIRY, PROC	19	0.	0.	0.	0.	0.	11.
FEEDS MFG	20	7610.	1329.	0.	15.	0.	0.
VEG OIL PROD	21	0.	0.	0.	0.	0.	0.
FLOUR, CER & B	22	0.	0.	0.	2.	0.	7.
SOFT DRINKS	23	0.	0.	0.	1.	0.	3.
BEERS & ALC	24	0.	0.	0.	3.	0.	9.
OTH FOODS, NES	25	0.	0.	0.	3.	0.	10.
TIRES & TUBES	26	0.	0.	0.	8.	0.	23.
OTH RUBBER PROD	27	1.	0.	0.	2.	0.	6.
LEATHER PROD	28	0.	0.	0.	1.	0.	4.
TEXTILE PROD	29	0.	173.	33.	13.	39.	7.
HOSIERY & KNITTED	30	0.	0.	0.	0.	0.	0.
CLOTHING	31	0.	0.	0.	1.	0.	2.
LUMBER & PLYWOOD	32	0.	0.	0.	0.	14.	5.
WOOD PROD NES	33	1.	0.	75.	2.	0.	0.
FURNIT & FIX	34	0.	0.	0.	0.	0.	0.
PULP & PAPER	35	0.	0.	0.	17.	0.	53.
PRINTING & PUB	36	0.	0.	0.	65.	1.	197.
IRON & STEEL	37	0.	0.	0.	1.	0.	80.
OTH PRIM METAL	38	0.	0.	0.	0.	0.	1.
METAL FAB PROD	39	0.	36.	3.	52.	11.	68.
MACHINERY	40	68.	204.	144.	69.	1.	400.
VEHICLES & OTH TRANS	41	0.	0.	0.	33.	43.	113.
ELECT APPLIANCES	42	0.	0.	0.	16.	0.	49.
CEMENT	43	0.	0.	0.	0.	0.	0.
OTH NON-MET	44	13.	0.	6.	3.	0.	6.
PETROLEUM	45	229.	935.	105.	57.	62.	256.
FERTILIZERS	46	0.	0.	24.	0.	0.	1.
CHEMICAL	47	183.	731.	25.	24.	19.	59.
MISC MFG	48	0.	0.	66.	23.	58.	162.
NEW CONSTRUCT	49	0.	0.	0.	0.	0.	0.
REPAIR CONST	50	50.	302.	41.	75.	0.	34.
TRANSP SERV	51	34.	1366.	6.	201.	38.	366.
STORAGE SERV	52	0.	0.	0.	1.	0.	4.
COMMUNIC	53	12.	36.	84.	30.	0.	73.
ELECT POWER	54	122.	710.	202.	74.	1.	619.
GAS PIPE SERV	55	79.	88.	14.	0.	0.	0.
WATER & OTH	56	0.	0.	33.	0.	0.	14.
WHOLESALE	57	43.	613.	44.	75.	30.	305.
RETAIL	58	4.	151.	58.	23.	16.	116.
FINANCE & OTH	59	138.	755.	75.	184.	12.	462.
REAL ESTATE	60	26.	53.	0.	0.	0.	0.
EDUCATION	61	0.	0.	0.	0.	0.	0.
HEALTH SERV	62	0.	0.	0.	0.	0.	0.
ACCOM & FOOD	63	0.	0.	19.	39.	1.	117.
BUSINESS SERV	64	61.	311.	28.	146.	12.	353.
PERSONAL SERV	65	39.	207.	30.	65.	1.	131.
NON-COMPETING IMP	66	0.	0.	686.	1.	0.	2.
VALUE ADDED	67	5934.	6595.	6846.	2330.	2195.	6444.
SDP		17200.	22301.	10589.	4083.	2603.	10671.

TABLE C-4 PRODUCTION TECHNOLOGY MATRIX (CONTINUED)
(IN THOUSANDS OF 1972 DOLLARS)

PAGE

		CRUDE OIL & GAS IND	OTH MINING IND	MEAT PROC IND	DAIRY IND	FEEDS MFR IND	FLOUR CER BAKERY IND
		13	14	15	16	17	18
WHEAT, UNMILLED	1	0.	0.	0.	0.	1043.	4795.
BARLEY,UNMILLED	2	0.	0.	0.	0.	2913.	1069.
OIL SEEDS	3	0.	0.	0.	0.	0.	0.
OTH CEREAL CROPS	4	0.	0.	0.	0.	976.	0.
HAY, FORAGE	5	0.	0.	0.	0.	0.	0.
LIVESTOCK	6	6.	3.	193307.	1.	0.	0.
POULTRY	7	0.	0.	7007.	0.	0.	0.
EGGS IN SHELL	8	0.	0.	0.	0.	0.	47.
MILK, CREAM UNP	9	0.	0.	0.	19329.	0.	17.
OTH AG PROD	10	83.	25.	28.	0.	0.	45.
FOREST PROD	11	0.	0.	1.	0.	0.	0.
FISHING, H & T	12	4.	1.	1.	0.	0.	0.
COAL	13	0.	15.	0.	5.	0.	0.
CRUDE OIL	14	0.	0.	0.	0.	0.	0.
NATURAL GAS	15	383.	1.	87.	36.	7.	6.
SULPHUR	16	0.	0.	0.	0.	0.	0.
OTH MIN PROD	17	27432.	314.	170.	13.	79.	10.
BEEF, PORK ETC.	18	195.	83.	10151.	35.	1012.	212.
DAIRY, PROC	19	122.	52.	518.	4884.	126.	89.
FEEDS MFR	20	0.	0.	67.	0.	1246.	81.
VEG OIL PROD	21	0.	0.	0.	0.	0.	0.
FLOUR, CER & B	22	78.	33.	131.	38.	3.	1051.
SOFT DRINKS	23	28.	12.	9.	3.	1.	1.
BEERS & ALC	24	95.	41.	32.	11.	2.	4.
OTH FOODS, NES	25	106.	45.	1045.	972.	339.	731.
TIRES & TUBES	26	253.	108.	84.	29.	5.	10.
OTH RUBBER PROD	27	63.	27.	21.	7.	1.	3.
LEATHER PROD	28	42.	18.	14.	5.	1.	2.
TEXTILE PROD	29	77.	0.	101.	17.	126.	316.
HOSIERY & KNITTED	30	0.	0.	0.	0.	0.	0.
CLOTHING	31	27.	12.	9.	3.	1.	1.
LUMBER & PLYWOOD	32	6.	3.	2.	1.	0.	0.
WOOD PROD NES	33	1.	3.	276.	76.	0.	3.
FURNIT & FIX	34	0.	0.	0.	0.	0.	0.
PULP & PAPER	35	583.	345.	2760.	2466.	106.	567.
PRINTING & PUB	36	2167.	925.	725.	246.	43.	87.
IRON & STEEL	37	21.	831.	7.	2.	0.	1.
OTH PRIM METAL	38	7.	3.	2.	1.	0.	0.
METAL FAB PROD	39	1295.	321.	847.	1283.	170.	48.
MACHINERY	40	4840.	2046.	528.	181.	32.	64.
VEHICLES & OTH TRANS	41	898.	350.	273.	93.	16.	33.
ELECT APPLIANCES	42	532.	227.	177.	60.	11.	21.
CEMENT	43	0.	0.	0.	0.	0.	0.
OTH NON-MET	44	70.	33.	60.	94.	1.	3.
PETROLEUM	45	2525.	1295.	112.	475.	46.	78.
FERTILIZERS	46	15.	6.	9.	2.	1.	1.
CHEMICAL	47	3470.	288.	1056.	99.	473.	178.
MISC MFR	48	1012.	452.	664.	246.	20.	79.
RES CONSTRUCT	49	0.	0.	0.	0.	0.	0.
REPAIR CONST	50	18403.	22.	841.	89.	20.	27.
TRANSP SERV	51	3444.	2361.	3623.	1195.	1328.	1188.
STORAGE SERV	52	45.	19.	15.	5.	577.	2.
COMMUNIC	53	2953.	518.	951.	184.	52.	76.
ELECT POWER	54	6688.	429.	480.	305.	93.	107.
GAS PIPE SERV	55	1275.	2.	245.	87.	18.	19.
WATER & OTH	56	372.	2.	0.	0.	0.	1.
WHOLESALE	57	3498.	1401.	5319.	584.	615.	438.
RETAIL	58	743.	440.	346.	128.	22.	51.
FINANCE & OTH	59	129699.	1689.	600.	301.	68.	224.
REAL ESTATE	60	0.	0.	0.	0.	0.	0.
EDUCATION	61	0.	0.	0.	0.	0.	3.
HEALTH SERV	62	0.	0.	0.	0.	0.	0.
ACCOM & FOOD	63	1287.	550.	428.	146.	26.	52.
BUSINESS SERV	64	35199.	1118.	649.	250.	30.	161.
PERSONAL SERV	65	4395.	676.	1430.	439.	75.	132.
NON-COMPETING IMP	66	19.	8.	52.	2.	0.	1.
VALUE ADDED	67	491317.	31505.	34772.	10769.	2670.	4465.
SUM		745772.	48629.	261622.	45168.	14396.	16556.

TABLE C-4 PRODUCTION TECHNOLOGY MATRIX (CONTINUED)
(IN THOUSANDS OF 1972 DOLLARS)

PAGE

		VEGETABLE OIL MILLS	SOFT DRINK MFR IND	BEERS, ALC MFR IND	OTH FOOD MFR IND	RUBBER PROD IND	LEATHER PROD IND
		19	20	21	22	23	24
WHEAT, UNMILLED	1	0.	0.	145.	265.	0.	0.
BARLEY,UNMILLED	2	0.	113.	4292.	106.	0.	0.
OIL SEEDS	3	3949.	0.	0.	0.	0.	0.
OTH CEREAL CROPS	4	0.	329.	437.	355.	0.	0.
HAY, FORAGE	5	0.	0.	0.	0.	0.	0.
LIVESTOCK	6	0.	1.	1.	0.	0.	0.
POULTRY	7	0.	0.	0.	0.	0.	0.
EGGS IN SHELL	8	1.	0.	0.	71.	0.	0.
MILK, CREAM UNP	9	2.	0.	0.	88.	0.	0.
OTH AG PROD	10	1.	7.	0.	0.	4.	1.
FOREST PROD	11	0.	0.	0.	0.	0.	0.
FISHING, H & T	12	0.	0.	1.	5.	0.	1.
COAL	13	0.	0.	0.	0.	1.	1.
CRUDE OIL	14	0.	0.	0.	0.	0.	0.
NATURAL GAS	15	0.	9.	0.	7.	4.	1.
SULPHUR	16	0.	0.	0.	0.	0.	0.
OTH MIN PROD	17	0.	0.	3.	7.	20.	1.
BEEF, PORK ETC.	18	141.	62.	37.	8.	14.	106.
DAIRY, PROC	19	4.	10.	23.	14.	6.	1.
FEEDS MFR	20	0.	0.	0.	0.	0.	0.
VEG OIL PROD	21	185.	0.	0.	0.	0.	0.
FLOOR, CER & B	22	5.	6.	15.	25.	4.	1.
SOFT DRINKS	23	2.	2.	5.	0.	1.	0.
BEERS & ALC	24	0.	11.	44.	9.	5.	1.
OTH FOODS, MES	25	2.	1054.	202.	155.	5.	3.
TIRES & TUBES	26	0.	20.	48.	3.	13.	2.
OTH RUBBER PROD	27	0.	5.	12.	1.	177.	106.
LEATHER PROD	28	0.	3.	8.	0.	42.	474.
TEXTILE PROD	29	40.	6.	14.	7.	844.	62.
HOSIERY & KNITTED	30	0.	0.	0.	0.	0.	0.
CLOTHING	31	0.	2.	5.	0.	8.	9.
LUMBER & PLYWOOD	32	0.	0.	1.	0.	0.	5.
WOOD PROD MES	33	74.	1.	123.	23.	26.	2.
FURNIT & FIX	34	0.	0.	0.	0.	0.	0.
PULP & PAPER	35	0.	396.	744.	91.	361.	36.
PRINTING & PUB	36	0.	172.	409.	28.	119.	18.
IRON & STEEL	37	0.	2.	4.	0.	5.	2.
OTH PRIM METAL	38	0.	1.	1.	0.	34.	0.
METAL FAB PROD	39	52.	395.	493.	67.	142.	35.
MACHINERY	40	139.	127.	300.	19.	64.	12.
VEHICLES & OTH TRANS	41	0.	65.	155.	10.	48.	6.
ELECT APPLIANCES	42	0.	42.	100.	6.	27.	4.
CEMENT	43	0.	0.	0.	0.	0.	0.
OTH NON-MET	44	4.	387.	656.	11.	48.	1.
PETROLEUM	45	65.	136.	34.	7.	61.	4.
FERTILIZERS	46	0.	1.	3.	0.	1.	0.
CHEMICAL	47	154.	157.	248.	25.	3000.	65.
MISC MFR	48	283.	116.	286.	70.	129.	46.
NEW CONSTRUCT	49	0.	0.	0.	0.	0.	0.
REPAIR CONST	50	13.	34.	82.	6.	36.	5.
TRANSP SERV	51	285.	249.	552.	151.	310.	39.
STORAGE SERV	52	94.	311.	450.	1.	148.	3.
COMMUNIC	53	13.	86.	180.	13.	114.	17.
ELECT POWER	54	80.	37.	207.	13.	109.	8.
GAS PIPE SERV	55	46.	22.	58.	16.	0.	0.
WATER & OTH	56	8.	18.	110.	3.	14.	1.
WHOLESALE	57	188.	357.	648.	97.	396.	71.
RETAIL	58	31.	76.	132.	10.	38.	7.
FINANCE & OTH	59	31.	211.	219.	32.	269.	48.
REAL ESTATE	60	52.	0.	0.	0.	0.	0.
EDUCATION	61	0.	0.	0.	0.	0.	0.
HEALTH SERV	62	0.	0.	0.	0.	0.	0.
ACCOM & FOOD	63	25.	102.	243.	15.	65.	10.
BUSINESS SERV	64	83.	213.	244.	31.	137.	43.
PERSONAL SERV	65	42.	96.	105.	33.	150.	26.
NON-COMPETING IMP	66	43.	2.	4.	22.	193.	1.
VALUE ADDED	67	3421.	4821.	12697.	801.	5998.	966.
SUP		9560.	10273.	24779.	2749.	13241.	2247.

TABLE C-4 PRODUCTION TECHNOLOGY MATRIX (CONTINUED) PAGE
(1$ THOUSANDS OF 1972 DOLLARS)

		TEXTILE PROD IND	KNITTING MILL IND	CLOTHING IND	WOOD PROD IND	FURNITURE IND	PULP & PAPER IND
		25	26	27	28	29	30
WHEAT, UNMILLED	1	0.	0.	0.	0.	0.	0.
BARLEY,UNMILLED	2	0.	0.	0.	0.	0.	0.
OIL SEEDS	3	0.	0.	0.	0.	0.	0.
OTH CEREAL CROPS	4	0.	0.	265.	0.	0.	0.
HAY, FORAGE	5	0.	0.	0.	0.	0.	0.
LIVESTOCK	6	0.	0.	1.	1.	0.	0.
POULTRY	7	0.	0.	0.	0.	0.	0.
EGGS IN SHELL	8	0.	0.	0.	0.	0.	0.
MILK, CREAM UNP	9	0.	0.	0.	0.	0.	0.
OTH AG PROD	10	3.	0.	0.	12.	3.	3.
FOREST PROD	11	0.	0.	0.	3006.	1.	1994.
FISHING, H & T	12	2.	0.	329.	0.	0.	0.
COAL	13	0.	0.	0.	1.	1.	0.
CRUDE OIL	14	0.	0.	0.	0.	0.	0.
NATURAL GAS	15	5.	0.	6.	21.	7.	84.
SULPHUR	16	0.	0.	0.	0.	0.	10.
OTH MIN PROD	17	0.	0.	0.	0.	0.	45.
BEEF, PORK ETC.	18	7.	1.	24.	26.	7.	8.
DAIRY, PROC	19	4.	1.	15.	16.	4.	6.
FEEDS MFR	20	0.	0.	0.	0.	0.	0.
VEG OIL PROD	21	0.	0.	0.	0.	0.	0.
FLOUR, CER & B	22	3.	0.	10.	10.	3.	3.
SOFT DRINKS	23	1.	0.	3.	4.	1.	1.
BEERS & ALC	24	3.	0.	12.	13.	3.	4.
OTH FOODS, MIS	25	9.	0.	13.	32.	4.	10.
TIRES & TUBES	26	9.	1.	31.	34.	9.	11.
OTH RUBBER PROD	27	23.	5.	8.	9.	450.	4.
LEATHER PROD	28	1.	2.	5.	6.	8.	2.
TEXTILE PROD	29	3156.	848.	2522.	66.	2349.	58.
HOSIERY & KNITTED	30	0.	10.	0.	0.	0.	0.
CLOTHING	31	23.	99.	5175.	4.	1.	1.
LUMBER & PLYWOOD	32	0.	0.	1.	5531.	862.	4.
WOOD PROD MIS	33	0.	0.	0.	3465.	114.	37.
FURNIT & FIX	34	1.	0.	0.	0.	180.	0.
PULP & PAPER	35	89.	28.	903.	276.	174.	1835.
PRINTING & PUB	36	74.	12.	265.	286.	79.	116.
IRON & STEEL	37	17.	0.	3.	67.	318.	1.
OTH PRIM METAL	38	0.	0.	1.	17.	35.	10.
METAL FAB PROD	39	49.	3.	97.	2575.	931.	123.
MACHINERY	40	55.	7.	199.	213.	58.	64.
VEHICLES & OTH TRANS	41	28.	3.	100.	109.	30.	34.
ELECT APPLIANCES	42	18.	2.	69.	71.	20.	22.
CEMENT	43	0.	0.	0.	0.	0.	0.
OTH NON-MET	44	12.	0.	9.	286.	68.	217.
PETROLEUM	45	20.	3.	36.	383.	28.	221.
FERTILIZERS	46	1.	0.	2.	2.	1.	1.
CHEMICAL	47	2065.	26.	121.	313.	38.	725.
MISC MFG	48	435.	10.	287.	951.	937.	328.
NON CONSTRUCT	49	0.	0.	0.	0.	0.	0.
REPAIR CONST	50	55.	2.	20.	152.	35.	60.
TRANSP SERV	51	220.	26.	304.	1001.	250.	700.
STORAGE SERV	52	2.	0.	5.	6.	2.	2.
COMMUNIC	53	90.	11.	180.	305.	108.	72.
ELECT POWER	54	18.	8.	255.	228.	58.	67.
GAS PIPE SERV	55	16.	0.	11.	33.	16.	177.
WATER & OTH	56	1.	2.	0.	0.	0.	12.
WHOLESALE	57	498.	25.	389.	1634.	810.	241.
RETAIL	58	27.	6.	131.	144.	46.	50.
FINANCE & OTH	59	236.	41.	632.	777.	261.	214.
REAL ESTATE	60	0.	0.	0.	0.	0.	0.
EDUCATION	61	0.	0.	0.	0.	0.	0.
HEALTH SERV	62	0.	0.	0.	0.	0.	0.
ACCOM & FOOD	63	48.	5.	158.	171.	47.	53.
BUSINESS SERV	64	92.	19.	202.	229.	132.	85.
PERSONAL SERV	65	105.	15.	300.	399.	147.	139.
NON-COMPETING IMP	66	1.	0.	2.	3.	7.	1.
VALUE ADDED	67	4808.	781.	8272.	15316.	6597.	5337.
SUM		12127.	2004.	21373.	38204.	15243.	13166.

TABLE C-6 PRODUCTION TECHNOLOGY MATRIX (CONTINUED)
(IN THOUSANDS OF 1972 DOLLARS)

PAGE

		PRINTING & PUBL IND	PRIMARY MET IND	METAL FAB IND	MACHINERY IND	TRANSP EQUIP IND	ELECTR APPL IND
		31	32	33	34	35	36
WHEAT, UNMILLED	1	0.	0.	0.	0.	0.	0.
BARLEY,UNMILLED	2	0.	0.	0.	0.	0.	0.
OIL SEEDS	3	0.	0.	0.	0.	0.	0.
OTH CEREAL CROPS	4	0.	0.	0.	0.	0.	0.
HAY, FORAGE	5	0.	0.	0.	0.	0.	0.
LIVESTOCK	6	1.	1.	1.	4.	1.	0.
POULTRY	7	0.	0.	0.	0.	0.	0.
EGGS IN SHELL	8	0.	0.	0.	0.	0.	0.
MILK, CREAM NEC	9	0.	0.	0.	0.	0.	0.
OTH AG PROD	10	11.	11.	17.	6.	8.	0.
FOREST PROD	11	0.	2.	0.	0.	0.	0.
FISHING, H & T	12	0.	0.	1.	0.	0.	0.
COAL	13	0.	0.	1.	0.	2.	0.
CRUDE OIL	14	0.	0.	0.	0.	0.	0.
NATURAL GAS	15	11.	120.	37.	10.	23.	0.
SULPHUR	16	0.	0.	0.	0.	0.	0.
OTH MIN PROD	17	0.	11612.	24.	77.	8.	2.
PAPP, PAPR EXC.	18	26.	25.	39.	15.	18.	1.
DAIRY, PROC	19	16.	16.	25.	9.	11.	1.
FEEDS MFR	20	0.	0.	0.	0.	0.	0.
VEG OIL PROD	21	0.	0.	0.	0.	0.	0.
FLOUR, CER & B	22	10.	11.	16.	6.	7.	0.
SOFT DRINKS	23	4.	4.	6.	2.	3.	0.
BEERS & ALC	24	13.	12.	19.	7.	9.	0.
OTH FOODS, MES	25	16.	16.	49.	25.	16.	0.
TIRES & TUBES	26	34.	32.	51.	168.	241.	1.
OTH RUBBER PROD	27	11.	89.	116.	200.	706.	72.
LEATHER PROD	28	6.	5.	8.	3.	4.	0.
TEXTILE PROD	29	221.	80.	48.	24.	339.	4.
HOSIERY & KNITTED	30	0.	0.	0.	0.	0.	0.
CLOTHING	31	4.	4.	6.	2.	3.	0.
LUMBER & PLYWOOD	32	1.	3.	251.	3.	1036.	1.
WOOD PROD NES	33	6.	88.	51.	35.	6.	1.
FURNIT & FIX	34	0.	64.	0.	0.	356.	1.
PULP & PAPER	35	6934.	252.	315.	84.	104.	37.
PRINTING & PUB	36	1110.	278.	439.	184.	199.	10.
IRON & STEEL	37	3.	10003.	19868.	1552.	1590.	24.
OTH PRIM METAL	38	165.	129.	1755.	119.	811.	79.
METAL FAB PROD	39	105.	2053.	7962.	4240.	2439.	254.
MACHINERY	40	213.	467.	742.	2816.	637.	10.
VEHICLES & OTH TRANS	41	110.	116.	211.	366.	2675.	4.
ELECT APPLIANCES	42	71.	68.	367.	1110.	937.	397.
CEMENT	43	0.	0.	0.	0.	0.	0.
OTH NON-MET	44	9.	497.	476.	66.	392.	10.
PETROLEUM	45	61.	271.	128.	69.	76.	2.
FERTILIZERS	46	2.	7.	3.	1.	1.	0.
CHEMICAL	47	473.	1022.	684.	149.	337.	100.
MISC MFP	48	288.	110.	385.	138.	277.	18.
NEW CONSTRUCT	49	0.	0.	0.	0.	0.	0.
REPAIR CONST	50	140.	694.	173.	82.	87.	7.
TRANSP SERV	51	667.	1665.	1099.	464.	631.	47.
STORAGE SERV	52	6.	6.	9.	3.	4.	0.
COMMUNIC	53	956.	288.	537.	236.	262.	22.
ELECT POWER	54	228.	781.	239.	55.	124.	9.
GAS PIPE SERV	55	25.	330.	82.	33.	52.	1.
WATER & OTH	56	0.	18.	7.	3.	10.	0.
WHOLESALE	57	550.	2912.	1808.	989.	1055.	59.
RETAIL	58	164.	109.	183.	67.	112.	4.
FINANCE & OTH	59	991.	907.	715.	300.	281.	55.
REAL ESTATE	60	0.	0.	0.	0.	0.	0.
EDUCATION	61	0.	0.	0.	0.	0.	0.
HEALTH SERV	62	0.	0.	0.	0.	0.	0.
ACCOM & FOOD	63	173.	165.	260.	97.	116.	6.
BUSINESS SERV	64	988.	829.	1156.	246.	222.	22.
PERSONAL SERV	65	219.	448.	99.	309.	299.	21.
NON-COMPETING IMP	66	3.	10.	4.	1.	2.	0.
VALUE ADDED	67	19184.	14691.	29779.	10701.	12163.	681.
SUM		34127.	50976.	70239.	24055.	28885.	1956.

TABLE C-6 PRODUCTION TECHNOLOGY MATRIX (CONTINUED) PAGE
(IN THOUSANDS OF 1972 DOLLARS)

		CEMENT MFR IND	CONCRETE PROD IND	PRIMARY NFE IND	OTH NON-METAL IND	PETROLEUM & COAL IND	FERTILIZER MFR IND
		37	38	39	40	41	42
WHEAT, UNMILLED	1	0.	0.	0.	0.	0.	0.
BARLEY,UNMILLED	2	0.	0.	0.	0.	0.	0.
OIL SEEDS	3	0.	0.	0.	0.	0.	0.
OTH CEREAL CROPS	4	0.	0.	0.	0.	0.	0.
HAY, FORAGE	5	0.	0.	0.	0.	0.	0.
LIVESTOCK	6	1.	1.	1.	0.	3.	0.
POULTRY	7	0.	0.	0.	0.	0.	0.
EGGS IN SHELL	8	0.	0.	0.	0.	0.	0.
MILK, CREAM UNP	9	0.	0.	0.	0.	0.	0.
OTH AG PROD	10	7.	10.	9.	5.	37.	0.
FOREST PROD	11	0.	0.	0.	0.	0.	0.
FISHING, H & T	12	0.	0.	0.	0.	2.	0.
COAL	13	0.	0.	0.	0.	199.	0.
CRUDE OIL	14	0.	0.	0.	0.	113755.	0.
NATURAL GAS	15	114.	43.	13.	116.	484.	11554.
SULPHUR	16	0.	0.	0.	0.	0.	5128.
OTH MIN PROD	17	413.	1875.	1023.	3394.	24.	1225.
BEEF, PORK ETC.	18	17.	24.	22.	11.	87.	0.
DAIRY, PROC	19	10.	15.	14.	7.	58.	0.
FEEDS MFR	20	0.	0.	0.	0.	0.	0.
VEG OIL PROD	21	0.	0.	0.	0.	0.	0.
FLOUR, CER & B	22	7.	9.	9.	4.	34.	0.
SOFT DRINKS	23	2.	3.	3.	2.	12.	0.
BEERS & ALC	24	8.	12.	11.	5.	42.	0.
OTH FOODS, MES	25	28.	13.	12.	6.	47.	199.
TIRES & TUBES	26	22.	31.	28.	14.	112.	0.
OTH RUBBER PROD	27	5.	105.	7.	3.	28.	48.
LEATHER PROD	28	4.	5.	5.	2.	18.	0.
TEXTILE PROD	29	27.	9.	10.	4.	38.	8.
FOOTWR & KNITTED	30	0.	0.	0.	0.	0.	0.
CLOTHING	31	2.	3.	3.	2.	12.	0.
LUMBER & PLYWOOD	32	1.	27.	1.	0.	3.	0.
WOOD PROD NES	33	9.	13.	8.	13.	54.	171.
FURNIT & FIX	34	1.	0.	0.	0.	0.	0.
PULP & PAPER	35	805.	144.	70.	1382.	963.	3661.
PRINTING & PUB	36	188.	264.	242.	120.	963.	749.
IRON & STEEL	37	2.	1082.	7.	1.	10.	109.
OTH PRIM METAL	38	5.	54.	1.	0.	3.	5.
METAL FAB PROD	39	101.	1098.	91.	363.	4476.	954.
MACHINERY	40	136.	194.	182.	88.	707.	0.
VEHICLES & OTH TRANS	41	70.	100.	92.	45.	1094.	0.
ELECT APPLIANCES	42	65.	65.	59.	29.	236.	0.
CHEMS	43	26.	2896.	3795.	6.	6.	0.
OTH MFG-ENT	44	349.	152.	20.	4.	41.	22.
PETROLEUM	45	73.	121.	399.	95.	857.	1784.
FERTILIZERS	46	3.	2.	2.	1.	7.	0.
CHEMICAL	47	656.	535.	292.	935.	9480.	5193.
MISC MFR	48	326.	246.	145.	43.	1312.	336.
NON CONSTRUCT	49	0.	0.	0.	0.	0.	0.
REPAIR CONST	50	109.	193.	132.	231.	4223.	1243.
TRANSP SERV	51	617.	1064.	1073.	796.	1326.	2826.
STORAGE SERV	52	8.	5.	5.	2.	20.	0.
COMMUNIC	53	146.	249.	145.	107.	489.	931.
ELECT POWER	54	315.	113.	47.	386.	960.	1554.
GAS PIPE SERV	55	334.	103.	23.	257.	16394.	2952.
WATER & OTH	56	8.	0.	0.	13.	0.	71.
WHOLESALE	57	298.	799.	898.	649.	1776.	1762.
RETAIL	58	63.	109.	120.	50.	299.	258.
FINANCE & OTH	59	330.	272.	333.	347.	4592.	1539.
REAL ESTATE	60	0.	0.	0.	0.	0.	0.
EDUCATION	61	0.	0.	0.	0.	0.	0.
HEALTH SERV	62	0.	0.	0.	0.	0.	0.
ACCOM & FOOD	63	110.	157.	144.	71.	572.	449.
BUSINESS SERV	64	156.	438.	700.	193.	1005.	1452.
PERSONAL SERV	65	297.	406.	576.	219.	1090.	410.
NCS-COMPETING IMP	66	2.	2.	2.	1.	9.	0.
VALUE ADDED	67	9579.	12963.	11771.	7453.	27654.	31975.
SOS		15850.	25622.	22537.	17432.	195564.	78513.

TABLE C-4 PRODUCTION TECHNOLOGY MATRIX (CONTINUED) PAGE
(IN THOUSANDS OF 1972 DOLLARS)

		CHEMICAL & REL IND	MISC MFR IND	NEW CONSTR IND	REPAIR CONSTR IND	TRANSP SERV IND	STORAGE SERV IND
		43	44	45	46	47	48
WHEAT, UNMILLED	1	0.	0.	0.	0.	0.	0.
BARLEY,UNMILLED	2	0.	0.	0.	0.	0.	0.
OIL SEEDS	3	0.	0.	0.	0.	0.	0.
OTH CEREAL CROPS	4	0.	0.	0.	0.	0.	0.
HAY, FORAGE	5	0.	0.	0.	0.	0.	0.
LIVESTOCK	6	3.	0.	5.	1.	3.	9.
POULTRY	7	0.	0.	0.	0.	0.	0.
EGGS IN SHELL	8	0.	0.	89.	5.	0.	0.
MILK, CREAM UNP	9	0.	0.	95.	6.	0.	0.
OTH AG PROD	10	29.	3.	156.	5.	36.	13.
FOREST PROD	11	0.	0.	993.	0.	0.	0.
FISHING, H & T	12	0.	0.	3.	0.	2.	1.
COAL	13	23.	0.	423.	0.	0.	0.
CRUDE OIL	14	0.	0.	0.	0.	0.	0.
NATURAL GAS	15	452.	5.	0.	0.	0.	0.
SULPHUR	16	20.	0.	0.	0.	0.	0.
OTH MIN PROD	17	109.	11.	7724.	0.	15.	0.
BEEF, PORK ETC.	18	69.	9.	150.	23.	85.	32.
DAIRY, PROC	19	46.	8.	94.	16.	53.	20.
FEEDS MFG	20	0.	0.	0.	3.	0.	0.
VEG OIL PROD	21	0.	0.	0.	13.	0.	0.
FLOUR, CER & B	22	152.	3.	60.	21.	30.	13.
SOFT DRINKS	23	9.	1.	21.	5.	12.	5.
BEERS & ALC	24	38.	3.	73.	5.	41.	15.
OTH FOODS, MFG	25	163.	8.	81.	7.	46.	17.
TIRES & TUBES	26	92.	10.	1307.	459.	1815.	41.
OTH RUBBER PROD	27	31.	12.	2006.	394.	199.	10.
LEATHER PROD	28	14.	9.	66.	0.	18.	7.
TEXTILE PROD	29	117.	79.	3498.	0.	33.	139.
HOSIERY & KNITTED	30	0.	0.	0.	0.	0.	0.
CLOTHING	31	9.	1.	21.	0.	12.	4.
LUMBER & PLYWOOD	32	3.	10.	21063.	12191.	3.	1.
WOOD PROD NES	33	220.	67.	16165.	0.	1.	0.
FURNIT & FIX	34	0.	1.	1009.	0.	0.	0.
PULP & PAPER	35	11438.	259.	5420.	0.	253.	314.
PRINTING & PUB	36	778.	79.	1670.	0.	1784.	351.
IRON & STEEL	37	9.	112.	57379.	12077.	9.	3.
OTH PRIM METAL	38	3.	98.	3439.	7548.	3.	1.
METAL FAB PROD	39	935.	424.	78365.	10568.	325.	121.
MACHINERY	40	569.	63.	14851.	13032.	689.	257.
VEHICLES & OTH TRANS	41	292.	29.	1828.	0.	2176.	133.
ELECT APPLIANCES	42	197.	151.	28065.	0.	976.	96.
CEMENT	43	0.	0.	3831.	1951.	0.	0.
OTH NON-MET	44	49.	143.	41914.	16260.	131.	11.
PETROLEUM	45	455.	26.	11148.	3077.	6763.	284.
FERTILIZERS	46	386.	1.	12.	0.	7.	2.
CHEMICAL	47	17301.	1294.	5392.	1508.	477.	193.
MISC MFR	48	452.	480.	9461.	3864.	394.	245.
NEW CONSTRUCT	49	0.	0.	0.	0.	0.	0.
REPAIR CONST	50	509.	26.	410.	0.	2706.	1334.
TRANSP SERV	51	3389.	130.	18613.	4902.	4422.	1603.
STORAGE SERV	52	17.	2.	35.	131.	19.	7.
COMMUNIC	53	861.	87.	1249.	281.	1337.	373.
ELECT POWER	54	672.	47.	362.	0.	2551.	246.
GAS PIPE SERV	55	992.	11.	4.	0.	0.	20.
WATER & OTH	56	26.	7.	16.	0.	100.	30.
WHOLESALE	57	2233.	248.	32093.	5828.	4626.	496.
RETAIL	58	257.	30.	9216.	2552.	2308.	192.
FINANCE & OTH	59	2268.	162.	9293.	0.	1562.	1049.
REAL ESTATE	60	0.	0.	0.	0.	0.	0.
EDUCATION	61	0.	0.	0.	0.	0.	0.
HEALTH SERV	62	0.	0.	0.	0.	0.	0.
ACCOM & FOOD	63	460.	46.	991.	0.	557.	238.
BUSINESS SERV	64	824.	66.	19668.	0.	1637.	345.
PERSONAL SERV	65	1027.	108.	10312.	0.	1639.	635.
NON-COMPETING IMP	66	6.	1.	15.	0.	8.	3.
VALUE ADDED	67	37921.	4980.	343679.	17395.	179753.	17510.
SUM		85897.	9341.	763795.	114130.	220313.	26194.

TABLE C-9 PRODUCTION TECHNOLOGY MATRIX (CONTINUED)
(IN THOUSANDS OF 1972 DOLLARS)

PAGE

		COMMUNIC SERV IND	ELECTRICAL POWER IND	GAS DISTRB IND	METAL & OTH IND	WHOLESALE TRADE	RETAIL TRADE
		49	50	51	52	53	54
WHEAT, MILLED	1	0.	0.	0.	0.	88.	0.
BARLEY,MILLED	2	0.	0.	0.	0.	27.	0.
OIL SEEDS	3	0.	0.	0.	0.	0.	0.
OTH CEREAL CROPS	4	0.	0.	0.	0.	0.	0.
HAY, FORAGE	5	0.	0.	0.	0.	0.	0.
LIVESTOCK	6	1.	1.	0.	0.	4.	21365.
POULTRY	7	0.	0.	0.	0.	0.	0.
EGGS IN SHELL	8	0.	0.	0.	0.	0.	0.
MILK, CREAM UNP	9	0.	0.	0.	0.	0.	0.
OTH AG PROD	10	17.	7.	6.	0.	89.	167.
FOREST PROD	11	0.	0.	0.	0.	0.	0.
FISHING, H & T	12	20.	0.	0.	0.	2.	7.
COAL	13	0.	9144.	0.	0.	0.	0.
CRUDE OIL	14	0.	0.	0.	0.	0.	0.
NATURAL GAS	15	3.	6669.	0.	0.	92.	587.
SULPHUR	16	0.	0.	0.	0.	0.	0.
OTH MIN PROD	17	0.	0.	0.	0.	3.	2.
PAPP, PAPR ETC.	18	48.	16.	15.	13.	142.	837.
DAIRY, PROC	19	25.	10.	9.	0.	84.	266.
FEEDS PRP	20	0.	0.	0.	0.	0.	0.
VEG OIL PROD	21	0.	0.	0.	0.	0.	0.
FLOUR, CER & B	22	16.	6.	6.	5.	74.	957.
SOFT DRINKS	23	6.	2.	2.	2.	19.	56.
BEER & ALC	24	19.	6.	7.	4.	66.	192.
OTH FOODS, MIS	25	22.	9.	8.	7.	78.	213.
TIRES & TUBES	26	52.	20.	19.	17.	175.	681.
OTH RUBBER PROD	27	13.	5.	5.	4.	43.	376.
LEATHER PROD	28	9.	3.	3.	3.	47.	80.
TEXTILE PROD	29	60.	6.	6.	5.	326.	2413.
HOSIERY & KNITTED	30	0.	0.	0.	0.	0.	0.
CLOTHING	31	6.	2.	2.	2.	19.	983.
LUMBER & PLYWOOD	32	1.	0.	0.	0.	261.	12.
WOOD PROD MIS	33	0.	0.	0.	0.	220.	660.
FURNIT & FIX	34	0.	0.	0.	0.	0.	0.
PULP & PAPER	35	120.	67.	64.	39.	1056.	7232.
PRINTING & PUB	36	1196.	267.	163.	196.	1742.	4814.
IRON & STEEL	37	4.	2.	2.	1.	77.	43.
OTH PRIM METAL	38	1.	1.	1.	0.	27.	14.
METAL FAB PROD	39	150.	61.	56.	51.	1147.	2689.
MACHINERY	40	328.	128.	119.	107.	1180.	3209.
VEHICLES & OTH TRANS	41	169.	66.	62.	55.	567.	1656.
ELECT APPLIANCES	42	2066.	83.	80.	36.	372.	1073.
CEMENT	43	0.	0.	0.	0.	0.	0.
OTH NON-MET	44	14.	6.	5.	5.	83.	223.
PETROLEUM	45	167.	462.	60.	1617.	1481.	2372.
FERTILIZERS	46	3.	1.	1.	1.	11.	31.
CHEMICAL	47	186.	52.	48.	43.	650.	1527.
MISC MFG	48	261.	63.	58.	52.	891.	1968.
RES CONSTRUCT	49	0.	0.	0.	0.	0.	0.
REPAIR CONST	50	3032.	4892.	1155.	1140.	143.	2189.
TRANSP SERV	51	4974.	1917.	104.	140.	2608.	8129.
STORAGE SERV	52	9.	4.	3.	3.	2714.	4345.
COMMUNIC	53	4108.	465.	279.	72.	3121.	11420.
ELECT POWER	54	280.	69.	150.	129.	659.	6021.
GAS PIPE SERV	55	15.	3062.	0.	0.	0.	2057.
WATER & OTH	56	8.	0.	2.	12.	89.	186.
WHOLESALE	57	484.	456.	124.	465.	1471.	2318.
RETAIL	58	1296.	809.	60.	350.	783.	2153.
FINANCE & OTH	59	2086.	3400.	1016.	59.	6924.	30479.
REAL ESTATE	60	0.	0.	0.	0.	0.	0.
EDUCATION	61	0.	0.	0.	0.	0.	0.
HEALTH SERV	62	0.	0.	0.	0.	0.	0.
ACCOM & FOOD	63	264.	104.	97.	87.	830.	2597.
BUSINESS SERV	64	2833.	490.	374.	1417.	2946.	4943.
PERSONAL SERV	65	1060.	458.	311.	1156.	2689.	6423.
NON-COMPETING IMP	66	4.	2.	1.	1.	27.	182.
VALUE ADDED	67	80131.	83998.	36263.	4337.	96342.	255877.
GDP		106376.	116813.	40687.	11600.	132799.	395437.

TABLE C-6 PRODUCTION TECHNOLOGY MATRIX (CONTINUED)
(IN THOUSANDS OF 1972 DOLLARS)

PAGE

		FINANCE	REAL ESTATE RNTL	EDUCATION & RELATED	HOSPITAL & HEALTH	ACCOM & FOOD SERV	BUSINESS SERV IND
WHEAT, UNMILLED	1	55	56	57	58	59	60
BARLEY,UNMILLED	2	0.	0.	0.	0.	0.	0.
OIL SEEDS	3	0.	0.	0.	0.	0.	0.
OTH CEREAL CROPS	4	0.	0.	0.	0.	0.	0.
HAY, FORAGE	5	0.	0.	0.	0.	0.	0.
LIVESTOCK	6	4.	4.	21.	2.	2.	3.
POULTRY	7	0.	0.	0.	0.	1193.	0.
FOOD IN SHELL	8	0.	34.	0.	0.	729.	0.
MILK, CREAM UNP	9	0.	39.	0.	0.	0.	0.
OTH AG PROD	10	80.	37.	297.	26.	933.	45.
FOREST PROD	11	0.	0.	0.	0.	0.	0.
FISHING, H & T	12	3.	0.	11.	1.	420.	2.
COAL	13	0.	0.	0.	0.	0.	0.
CRUDE OIL	14	0.	0.	0.	0.	0.	0.
NATURAL GAS	15	107.	0.	1789.	6.	42.	0.
SULFUR	16	0.	0.	0.	0.	0.	0.
OTH MIN PROD	17	1.	0.	2.	61.	16.	0.
BEEF, PORK ETC.	18	190.	149.	625.	62.	12891.	107.
DAIRY, PROC	19	118.	101.	389.	39.	3133.	66.
FEEDS MFR	20	0.	17.	0.	0.	0.	0.
VEG OIL PROD	21	0.	91.	0.	0.	6.	0.
FLOUR, CIP & R	22	75.	132.	240.	25.	2965.	42.
SOFT DRINKS	23	27.	103.	89.	9.	485.	15.
BEERS & ALC	24	92.	81.	304.	30.	24.	52.
OTH FOODS, NES	25	103.	46.	338.	34.	3321.	58.
YARNS & TUBES	26	245.	0.	808.	80.	65.	136.
OTH TEXTILE PROD	27	61.	287.	200.	36.	16.	37.
LEATHER PROD	28	40.	0.	133.	13.	11.	23.
TEXTILE PROD	29	74.	670.	277.	750.	1206.	51.
KNITTED & KNITTED	30	0.	0.	0.	0.	0.	0.
CLOTHING	31	27.	0.	88.	9.	81.	15.
LUMBER & PLYWOOD	32	0.	2190.	19.	2.	2.	15.
WOOD PROD NES	33	1.	0.	4.	0.	0.	1.
FURNIT & FIX	34	0.	0.	32.	0.	42.	0.
PULP & PAPER	35	565.	0.	2068.	185.	1243.	450.
PRINTING & PUB	36	2561.	0.	13478.	688.	553.	1312.
IRON & STEEL	37	21.	0.	69.	7.	5.	12.
OTH FAB METAL	38	7.	0.	22.	2.	2.	4.
METAL FAB PROD	39	727.	937.	2399.	239.	241.	439.
MACHINERY	40	1542.	3199.	5084.	505.	469.	867.
VEHICLES & OTH TRANS	41	796.	0.	2623.	260.	209.	447.
ELECT APPLIANCES	42	516.	0.	2084.	169.	136.	293.
CYCLES	43	0.	105.	0.	0.	0.	0.
OTH MFR-MFG	44	68.	0.	223.	39.	24.	36.
PETROLEUM	45	310.	461.	1849.	402.	311.	251.
FERTILIZERS	46	15.	0.	49.	5.	6.	8.
CHEMICAL	47	619.	871.	2042.	2299.	215.	348.
MISC MFG	48	755.	2284.	6756.	2456.	386.	479.
NEW CONSTRUCT	49	0.	0.	0.	0.	0.	0.
REPAIR CONST	50	29678.	27210.	0.	0.	753.	0.
TRANSP SERV	51	1370.	2848.	10016.	620.	1491.	893.
STORAGE SERV	52	43.	3996.	143.	14.	2537.	338.
COMMUNIC	53	4989.	2150.	3003.	4270.	826.	2289.
ELECT POWER	54	834.	1102.	1373.	174.	479.	158.
GAS PIPE SERV	55	636.	780.	1278.	20.	178.	0.
WATER & OTH	56	123.	183.	0.	5.	31.	2.
WHOLESALE	57	1969.	1759.	3408.	2085.	2371.	1050.
RETAIL	58	716.	929.	2376.	371.	973.	463.
FINANCE & OTH	59	23394.	21601.	3673.	5138.	4055.	4300.
REAL ESTATE	60	0.	2415.	0.	0.	0.	0.
EDUCATION	61	0.	0.	62.	6.	0.	0.
HEALTH SERV	62	0.	0.	0.	0.	0.	11.
ACCOM & FOOD	63	1248.	2205.	4115.	408.	328.	732.
BUSINESS SERV	64	4117.	10764.	3975.	2490.	1999.	3752.
PERSONAL SERV	65	5479.	2130.	3121.	1805.	871.	3071.
NCR-COMPETING IMP	66	19.	1199.	8.	0.	5.	0.
VALUE ADDED	67	342762.	293610.	169016.	79120.	78306.	107610.
GDP		426194.	386202.	249060.	105030.	126754.	133530.

TABLE C-4 PRODUCTION TECHNOLOGY MATRIX (CONTINUED)
(IN THOUSANDS OF 1972 DOLLARS)

PAGE

		PERSONAL SERV IND
		61
WHEAT, UNMILLED	1	0.
BARLEY,UNMILLED	2	0.
OIL SEEDS	3	0.
OTH CEREAL CROPS	4	0.
HAY, FORAGE	5	0.
LIVESTOCK	6	0.
POULTRY	7	0.
WOOD IN ERSLS	8	0.
MILK, CREAM UNP	9	0.
OTH AG PROD	10	233.
FOREST PROD	11	0.
FISHING, H & T	12	3.
COAL	13	0.
CRUDE OIL	14	0.
NATURAL GAS	15	8.
SULPHUR	16	0.
OTH MIN PROD	17	5.
BEEF, PORK ETC.	18	170.
DAIRY, PROC	19	111.
FEEDS MFG	20	16.
VEG OIL PROD	21	0.
FLOUR, CEP & B	22	71.
SOFT DRINKS	23	25.
BEERS & ALC	24	66.
OTH FOODS, MIS	25	96.
TIRES & TUBES	26	330.
OTH RUBBER PROD	27	339.
LEATHER PROD	28	335.
TEXTILE PROD	29	2000.
HOSIERY & KNITTED	30	0.
CLOTHING	31	23.
LUMBER & PLYWOOD	32	0.
WOOD PROD MIS	33	1761.
FURNIT & FIX	34	0.
PULP & PAPER	35	1021.
PRINTING & PUB	36	2061.
IRON & STEEL	37	20.
OTH PRIM METAL	38	6.
METAL FAB PROD	39	1557.
MACHINERY	40	1668.
VEHICLES & OTH TRANS	41	747.
ELECT APPLIANCES	42	484.
CHEMS	43	0.
OTH NON-MET	44	111.
PETROLPDT	45	1555.
FERTILIZERS	46	10.
CHEMICAL	47	6890.
MISC MFG	48	1992.
NEW CONSTRUCT	49	0.
REPAIR CONST	50	718.
TRANSP SERV	51	2496.
STORAGE SERV	52	41.
COMMUNIC	53	1795.
ELECT POWER	54	1772.
GAS PIPE SERV	55	31.
WATER & OTH	56	25.
WHOLESALE	57	3430.
RETAIL	58	1815.
FINANCE & INS	59	13803.
REAL ESTATE	60	0.
EDUCATION	61	0.
HEALTH SERV	62	10.
ACCOM & FOOD	63	1772.
BUSINESS SERV	64	3130.
PERSONAL SERV	65	8745.
NON-COMPETING IMP	66	0.
VALUE ADDED	67	123187.
SUM		185700.

TABLE C-5 IMPACT MULTIPLIERS

		WHEAT, UNMILLED	BARLEY, UNMILLED	OIL SEEDS	OTH CEREAL CROPS	HAY, FORAGE	LIVESTOCK
		1	2	3	4	5	6
WHEAT PRODUCERS	1	1.077257	0.000332	0.000248	0.000236	0.010251	0.006877
BARLEY PRODUCERS	2	0.000308	1.073344	0.000292	0.000248	0.009927	0.130954
OIL SEEDS PRDRS	3	0.000009	0.000009	1.066588	0.000009	0.000008	0.000005
OTH GRAIN PRDRS	4	0.000341	0.000393	0.000325	1.040274	0.052909	0.166294
FORAGE PRDRS	5	0.000418	0.000466	0.000416	0.007808	0.970416	0.316639
LIVESTOCK PRDRS	6	0.001199	0.001330	0.001204	0.000914	0.000885	0.987817
POULTRY & EGG PRDRS	7	0.000125	0.000145	0.000111	0.000108	0.000117	0.000193
DAIRY PRODUCERS	8	0.000238	0.000273	0.000211	0.000197	0.000221	0.015881
OTH AG PRDRS	9	0.000264	0.000301	0.000225	0.000217	0.000260	0.000220
FORESTRY PRDRS	10	0.004125	0.005564	0.003872	0.003671	0.003964	0.003156
FISHING, H & T PRDPS	11	0.000028	0.000031	0.000024	0.000022	0.000034	0.000025
COAL MINING IND	12	0.001820	0.001737	0.001506	0.001365	0.001459	0.002584
CRUDE OIL & GAS IND	13	0.065832	0.074660	0.054127	0.045877	0.049117	0.032756
OTH MINING IND	14	0.010426	0.011586	0.008184	0.007498	0.008702	0.006423
MEAT PROC IND	15	0.000922	0.001063	0.000806	0.000761	0.000868	0.003170
DAIRY INDUSTRY	16	0.000413	0.000473	0.000358	0.000337	0.000391	0.000662
FEEDS MFR IND	17	0.000139	0.000162	0.000130	0.000117	0.000124	0.033730
FLOUR CER BAKERY IND	18	0.000409	0.000514	0.000375	0.000355	0.000393	0.000339
VEGETABLE OIL MILLS	19	0.000020	0.000020	0.000020	0.000021	0.000018	0.000012
SOFT DRINKS MFR IND	20	0.000090	0.000100	0.000080	0.000078	0.000084	0.000069
BEERS & ALC MFR IND	21	0.000211	0.000241	0.000181	0.000170	0.000201	0.000173
OTH FOOD MFR IND	22	0.000842	0.001037	0.000743	0.000730	0.000795	0.001455
RUBBER PROD IND	23	0.003248	0.003515	0.001875	0.001802	0.008130	0.003718
LEATHER PROD IND	24	0.000155	0.000175	0.000125	0.000130	0.000186	0.000154
TEXTILE PROD IND	25	0.011695	0.011834	0.010514	0.008122	0.051576	0.020468
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.000136	0.000149	0.000125	0.000100	0.000215	0.000128
WOOD PROD IND	28	0.007163	0.007671	0.006130	0.005206	0.006557	0.005113
FURNITURE IND	29	0.000072	0.000078	0.000055	0.000050	0.000068	0.000051
PULP & PAPER IND	30	0.020655	0.028895	0.019697	0.018990	0.020018	0.016008
PRINTING & PUBL IND	31	0.005985	0.006928	0.005108	0.004842	0.005550	0.004659
PRIMARY MET IND	32	0.023444	0.024780	0.017092	0.015377	0.020159	0.014724
METAL FAB IND	33	0.025008	0.026737	0.017829	0.016323	0.021966	0.015549
MACHINERY IND	34	0.063655	0.064270	0.037347	0.035979	0.055541	0.033184
TRANSP EQUIP IND	35	0.002960	0.003307	0.002328	0.002119	0.002693	0.002177
ELECTR APPL IND	36	0.005658	0.005922	0.003872	0.003595	0.004963	0.003444
CEMENT MFR IND	37	0.001153	0.001279	0.001004	0.000859	0.000978	0.000834
CONCRETE PROD IND	38	0.002378	0.002575	0.001977	0.001702	0.001986	0.001665
READY MIX MFR IND	39	0.002092	0.002265	0.001739	0.001497	0.001747	0.001464
OTH NON-METAL IND	40	0.001618	0.001752	0.001345	0.001158	0.001351	0.001133
PETROLEUM & COAL IND	41	0.072417	0.078027	0.056394	0.040225	0.046459	0.033236
FERTILIZER MFR IND	42	0.103150	0.128095	0.093003	0.099143	0.088496	0.058510
CHEMICAL & REL IND	43	0.067219	0.109000	0.069641	0.065398	0.068193	0.057226
MISC MFR IND	44	0.006240	0.007034	0.005309	0.004893	0.007156	0.004987
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.032157	0.034189	0.027178	0.022817	0.025723	0.022534
TRANSP SERV IND	47	0.018133	0.021674	0.015791	0.014922	0.016827	0.017225
STORAGE SERV IND	48	0.002161	0.002249	0.002095	0.002018	0.002040	0.002952
COMMUNIC SERV IND	49	0.022109	0.021082	0.018198	0.014342	0.013749	0.011013
ELECTRICAL POWER	50	0.021810	0.020538	0.018046	0.016492	0.017535	0.032055
GAS DISTRIB IND	51	0.012778	0.014763	0.010770	0.012118	0.010146	0.014510
WATER & OTH IND	52	0.000315	0.000368	0.000282	0.000278	0.000284	0.000222
WHOLESALE TRADE	53	0.049116	0.051448	0.045021	0.042374	0.047359	0.041141
RETAIL TRADE	54	0.010055	0.010602	0.011703	0.006879	0.004677	0.004984
FINANCE	55	0.081806	0.079437	0.061795	0.063109	0.054231	0.073121
REAL ESTATE RENTAL	56	0.075291	0.075335	0.079918	0.084160	0.068048	0.045032
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000003	0.000003	0.000002	0.000003	0.000004	0.000004
ACCOM & FOOD SERV	59	0.003601	0.004131	0.003162	0.003056	0.003365	0.002723
BUSINESS SERV IND	60	0.018975	0.020589	0.017816	0.015812	0.021357	0.024265
PERSONAL SERV IND	61	0.011233	0.012261	0.007967	0.014523	0.015370	0.020428
SUM		1.951098	2.056717	1.812259	1.751405	1.833079	2.301149

TABLE C-5 IMPACT MULTIPLIERS (CONTINUED)

		POULTRY	EGGS IN SHELL	MILK, CREAM UNP	OTH AG PROD	FOREST PROD	FISHING, H & T
		7	8	9	10	11	12
WHEAT PRODUCERS	1	0.045243	0.045243	0.053420	0.000094	0.001134	0.000102
BARLEY PRODUCERS	2	0.124867	0.124867	0.082665	0.000158	0.003324	0.000153
OIL SEEDS PRDRS	3	0.000003	0.000003	0.000004	0.000000	0.000002	0.000000
OTH GRAIN PRDRS	4	0.046136	0.046136	0.061466	0.000177	0.003013	0.000164
FORAGE PRDRS	5	0.011513	0.011513	0.165421	0.000269	0.004567	0.000241
LIVESTOCK PRDRS	6	0.029305	0.029305	0.032667	0.000795	0.013820	0.000707
POULTRY & EGG PRDRS	7	1.140933	1.140933	0.000317	0.000078	0.000864	0.000045
DAIRY PRODUCERS	8	0.003581	0.003581	1.026865	0.000103	0.001093	0.000105
OTH AG PRDRS	9	0.000250	0.000250	0.000298	1.215209	0.001975	0.000130
FORESTRY PRDRS	10	0.004126	0.004126	0.004082	0.001755	1.120893	0.001922
FISHING, H & T PRDRS	11	0.000054	0.000054	0.000033	0.000017	0.000094	1.013638
COAL MINING IND	12	0.001625	0.001625	0.003548	0.001962	0.000490	0.000204
CRUDE OIL & GAS IND	13	0.057894	0.057894	0.050094	0.020233	0.013626	0.015735
OTH MINING IND	14	0.009974	0.009974	0.008398	0.002989	0.007102	0.007628
MEAT PROC IND	15	0.041403	0.041403	0.005930	0.000521	0.018949	0.000427
DAIRY INDUSTRY	16	0.005996	0.005996	0.001124	0.000187	0.001843	0.000194
FEEDS MFR IND	17	0.553874	0.553874	0.068243	0.000079	0.005464	0.000061
FLOUR CER BAKERY IND	18	0.000648	0.000648	0.000469	0.000157	0.001227	0.000168
VEGETABLE OIL MILLS	19	0.000006	0.000006	0.000010	0.000001	0.000064	0.000000
SOFT DRINKS MFR IND	20	0.000095	0.000095	0.000087	0.000032	0.000330	0.000036
BEERS & ALC MFR IND	21	0.000308	0.000308	0.000242	0.000067	0.000963	0.000106
OTH FOOD MFR IND	22	0.014710	0.014710	0.002429	0.000240	0.001934	0.000247
RUBBER PROD IND	23	0.002663	0.002663	0.003893	0.000827	0.005463	0.001460
LEATHER PROD IND	24	0.000196	0.000196	0.000201	0.000065	0.000619	0.000101
TEXTILE PROD IND	25	0.010702	0.010702	0.023418	0.005808	0.007418	0.021775
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.000146	0.000146	0.000186	0.000067	0.000428	0.000117
WOOD PROD IND	28	0.004473	0.004473	0.006789	0.012999	0.006670	0.009201
FURNITURE IND	29	0.000070	0.000070	0.000079	0.000025	0.000201	0.000265
PULP & PAPER IND	30	0.022058	0.022058	0.020594	0.003614	0.018303	0.006575
PRINTING & PUBL IND	31	0.006902	0.006902	0.006419	0.001754	0.022984	0.002636
PRIMARY MET IND	32	0.015522	0.015522	0.020283	0.007938	0.024625	0.009330
METAL FAB IND	33	0.021055	0.021055	0.021895	0.008848	0.032861	0.012391
MACHINERY IND	34	0.023867	0.023867	0.036514	0.021359	0.029670	0.008280
TRANSP EQUIP IND	35	0.003669	0.003669	0.003811	0.000971	0.012807	0.019918
ELECTR APPL IND	36	0.003992	0.003992	0.004569	0.002102	0.009720	0.002343
CEMENT MFR IND	37	0.000827	0.000827	0.001228	0.000426	0.001182	0.000225
CONCRETE PROD IND	38	0.001916	0.001916	0.002446	0.001017	0.002579	0.000649
READY MIX MFR IND	39	0.001685	0.001685	0.002152	0.000894	0.002269	0.000571
OTH NON-METAL IND	40	0.001303	0.001303	0.001664	0.000692	0.001755	0.000441
PETROLEUM & COAL IND	41	0.036204	0.036204	0.068596	0.014215	0.021533	0.026244
FERTILIZER MFR IND	42	0.024804	0.024804	0.034928	0.002918	0.001431	0.000183
CHEMICAL & REL IND	43	0.064591	0.064591	0.082934	0.010013	0.022752	0.022584
MISC MFR IND	44	0.005856	0.005856	0.006493	0.009916	0.011441	0.026481
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.018745	0.018745	0.033914	0.009343	0.029594	0.003229
TRANSP SERV IND	47	0.069458	0.069458	0.086624	0.005430	0.068018	0.023322
STORAGE SERV IND	48	0.023670	0.023670	0.004650	0.000419	0.001947	0.000558
COMMUNIC SERV IND	49	0.011665	0.011665	0.013008	0.009789	0.015008	0.002846
ELECTRICAL POWER	50	0.019821	0.019821	0.043702	0.024616	0.005775	0.002103
GAS DISTRIB IND	51	0.012762	0.012762	0.015397	0.004388	0.003475	0.002950
WATER & OTH IND	52	0.000272	0.000272	0.000272	0.003871	0.000216	0.000088
WHOLESALE TRADE	53	0.046946	0.046946	0.058233	0.010084	0.033973	0.017855
RETAIL TRADE	54	0.005651	0.005651	0.012609	0.007968	0.009542	0.007503
FINANCE	55	0.048101	0.048101	0.078938	0.018490	0.070036	0.014211
REAL ESTATE RENTAL	56	0.018175	0.018175	0.027598	0.000051	0.000674	0.000048
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000003	0.000003	0.000004	0.000001	0.000006	0.000001
ACCOM & FOOD SERV	59	0.003760	0.003760	0.003435	0.003135	0.012958	0.001417
BUSINESS SERV IND	60	0.016991	0.016991	0.029184	0.007211	0.048722	0.008548
PERSONAL SERV IND	61	0.014286	0.014286	0.022071	0.006504	0.025706	0.003454
SUM		2.655326	2.655326	2.346524	1.462868	1.765283	1.293893

TABLE C-5 IMPACT MULTIPLIERS (CONTINUED)

PAGE

		COAL	CRUDE OIL	NATURAL GAS	SULPHUR	OTH MIN PROD	BEEF, PORK ETC.
		13	14	15	16	17	18
WHEAT PRODUCERS	1	0.000709	0.000211	0.000211	0.000211	0.000714	0.007156
BARLEY PRODUCERS	2	0.000941	0.000271	0.000271	0.000271	0.000933	0.100511
OIL SEEDS PRDRS	3	0.000001	0.000002	0.000002	0.000002	0.000000	0.000004
OTH GRAIN PRDRS	4	0.000930	0.000267	0.000267	0.000267	0.000917	0.124638
FORAGE PRDRS	5	0.001249	0.000354	0.000354	0.000354	0.001219	0.233998
LIVESTOCK PRDRS	6	0.003476	0.000982	0.000982	0.000982	0.003379	0.729218
POULTRY & EGG PRDRS	7	0.000409	0.000119	0.000119	0.000119	0.000413	0.032131
DAIRY PRODUCERS	8	0.000932	0.000269	0.000269	0.000269	0.000939	0.013057
OTH AG PRDRS	9	0.001219	0.000356	0.000356	0.000356	0.001233	0.000393
FORESTRY PRDRS	10	0.003652	0.001715	0.001715	0.001715	0.003653	0.005471
FISHING, H & T PRDRS	11	0.000098	0.000029	0.000029	0.000029	0.000099	0.000045
COAL MINING IND	12	1.013345	0.000910	0.000910	0.000910	0.001373	0.002194
CRUDE OIL & GAS IND	13	0.020283	1.005627	1.005627	1.005627	0.019343	0.028526
OTH MINING IND	14	0.014889	0.041941	0.041941	0.041941	1.017414	0.007062
MEAT PROC IND	15	0.003755	0.001083	0.001083	0.001083	0.003793	1.044337
DAIRY INDUSTRY	16	0.001855	0.000532	0.000532	0.000532	0.001875	0.003143
FEEDS MFR IND	17	0.000395	0.000118	0.000118	0.000118	0.000395	0.040769
FLOUR CER BAKERY IND	18	0.001279	0.000380	0.000380	0.000380	0.001291	0.000993
VEGETABLE OIL MILLS	19	0.000002	0.000005	0.000005	0.000005	0.000001	0.000010
SOFT DRINKS MFR IND	20	0.000348	0.000100	0.000100	0.000100	0.000351	0.000115
BEERS & ALC MFR IND	21	0.001015	0.000289	0.000289	0.000289	0.001026	0.000329
OTH FOOD MFR IND	22	0.001838	0.000544	0.000544	0.000544	0.001858	0.006160
RUBBER PROD IND	23	0.005662	0.001965	0.001965	0.001965	0.005787	0.003854
LEATHER PROD IND	24	0.000650	0.000199	0.000199	0.000199	0.000651	0.000247
TEXTILE PROD IND	25	0.003528	0.001139	0.001139	0.001139	0.002520	0.016683
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.000455	0.000128	0.000128	0.000128	0.000450	0.000180
WOOD PROD IND	28	0.004994	0.006320	0.006320	0.006320	0.003224	0.006427
FURNITURE IND	29	0.000236	0.000065	0.000065	0.000065	0.000202	0.000072
PULP & PAPER IND	30	0.018985	0.006847	0.006847	0.006847	0.021089	0.028973
PRINTING & PUBL IND	31	0.024126	0.007142	0.007142	0.007142	0.024453	0.008342
PRIMARY MFT IND	32	0.031379	0.017212	0.017212	0.017212	0.041344	0.015822
METAL FAB IND	33	0.027565	0.013742	0.013742	0.013742	0.027301	0.019271
MACHINERY IND	34	0.049734	0.017067	0.017067	0.017067	0.053343	0.029276
TRANSP EQUIP IND	35	0.014787	0.003218	0.003218	0.003218	0.011101	0.003696
ELECTR APPL IND	36	0.011221	0.003472	0.003472	0.003472	0.011408	0.004520
CEMENT MFR IND	37	0.000779	0.001364	0.001364	0.001364	0.000559	0.000835
CONCRETE PROD IND	38	0.001905	0.002600	0.002600	0.002600	0.001539	0.001807
READY MIX MFR IND	39	0.001677	0.002287	0.002287	0.002287	0.001354	0.001590
OTH NON-METAL IND	40	0.001297	0.001769	0.001769	0.001769	0.001047	0.001230
PETROLEUM & COAL IND	41	0.029334	0.007398	0.007398	0.007398	0.031052	0.027838
FERTILIZER MFR IND	42	0.000636	0.000211	0.000211	0.000211	0.000623	0.044215
CHEMICAL & REL IND	43	0.021830	0.012409	0.012409	0.012409	0.021255	0.052427
MISC MFR IND	44	0.020497	0.005221	0.005221	0.005221	0.013758	0.008127
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.016377	0.039944	0.039944	0.039944	0.009128	0.020628
TRANSP SERV IND	47	0.038208	0.014093	0.014093	0.014093	0.061382	0.033455
STORAGE SERV IND	48	0.001959	0.000730	0.000730	0.000730	0.001911	0.003540
COMMUNIC SERV IND	49	0.014166	0.009943	0.009943	0.009943	0.017599	0.014206
ELECTRICAL POWER	50	0.062452	0.011212	0.011212	0.011212	0.012610	0.027187
GAS DISTRIB IND	51	0.006418	0.003650	0.003650	0.003650	0.004493	0.012845
WATER & OTH IND	52	0.001490	0.000616	0.000616	0.000616	0.000217	0.000238
WHOLESALE TRADE	53	0.041842	0.013894	0.013894	0.013894	0.041694	0.056176
RETAIL TRADE	54	0.014361	0.003749	0.003749	0.003749	0.012017	0.006131
FINANCE	55	0.066449	0.193930	0.193930	0.193930	0.054952	0.062779
REAL ESTATE RENTAL	56	0.000279	0.000080	0.000080	0.000080	0.000276	0.033877
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000005	0.000006	0.000006	0.000006	0.000005	0.000004
ACCOM & FOOD SERV	59	0.013659	0.003874	0.003874	0.003874	0.013813	0.004544
BUSINESS SERV IND	60	0.043106	0.054578	0.054578	0.054578	0.032189	0.023334
PERSONAL SERV IND	61	0.020521	0.012838	0.012838	0.012838	0.021466	0.023389
SUM		1.685173	1.530994	1.530994	1.530994	1.620418	2.978823

TABLE C-5 IMPACT MULTIPLIERS (CONTINUED)

		DAIRY, PROC 19	FEEDS MFR 20	VEG OIL PROD 21	FLOUR, CER & B 22	SOFT DRINKS 23	BEERS & ALC 24
WHEAT PRODUCERS	1	0.028861	0.089648	0.000605	0.339436	0.012642	0.007862
BARLEY PRODUCERS	2	0.041360	0.247622	0.001924	0.079606	0.018604	0.187248
OIL SEEDS PRDRS	3	0.000003	0.000004	0.889222	0.000004	0.000001	0.000002
OTH GRAIN PRDRS	4	0.033407	0.091294	0.002279	0.009652	0.049743	0.020312
FORAGE PRDRS	5	0.080135	0.020035	0.004038	0.004856	0.003377	0.001330
LIVESTOCK PRDRS	6	0.017511	0.057796	0.012276	0.012108	0.007205	0.003184
POULTRY & EGG PRDRS	7	0.001084	0.003461	0.000752	0.035579	0.003752	0.000624
DAIRY PRODUCERS	8	0.493717	0.007020	0.000864	0.006259	0.004854	0.001156
OTH AG PRDRS	9	0.000369	0.000383	0.000378	0.003859	0.001223	0.000370
FORESTRY PRDRS	10	0.015867	0.006794	0.004208	0.011327	0.012142	0.010124
FISHING, H & T PRDRS	11	0.000102	0.000099	0.000033	0.000149	0.000298	0.000107
COAL MINING IND	12	0.002690	0.001742	0.001528	0.001598	0.000888	0.001288
CRUDE OIL & GAS IND	13	0.036373	0.035986	0.029933	0.035320	0.019076	0.019588
OTH MINING IND	14	0.010792	0.014563	0.006686	0.008113	0.013698	0.010462
MEAT PROC IND	15	0.004951	0.081807	0.016772	0.016282	0.009103	0.003646
DAIRY INDUSTRY	16	1.122284	0.011734	0.001001	0.007360	0.002522	0.001788
FEEDS MFR IND	17	0.033385	1.098889	0.000854	0.006488	0.002440	0.000531
FLOUR CER BAKERY IND	18	0.001495	0.001124	0.001028	1.068751	0.002360	0.001320
VEGETABLE OIL MILLS	19	0.000006	0.000010	1.019692	0.000009	0.000003	0.000005
SOFT DRINKS MFR IND	20	0.000185	0.000158	0.000270	0.000179	1.000360	0.000329
BEERS & ALC MFR IND	21	0.000607	0.000523	0.000190	0.000650	0.001709	1.002024
OTH FOOD MFR IND	22	0.027259	0.028964	0.001023	0.051175	0.109898	0.009633
RUBBER PROD IND	23	0.004342	0.004248	0.002142	0.004212	0.005580	0.005193
LEATHER PROD IND	24	0.000384	0.000317	0.000177	0.000353	0.000673	0.000594
TEXTILE PROD IND	25	0.013798	0.020499	0.011769	0.034482	0.005223	0.005495
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.000277	0.000249	0.000132	0.000310	0.000464	0.000419
WOOD PROD IND	28	0.008551	0.006114	0.014940	0.006135	0.006084	0.011152
FURNITURE IND	29	0.000129	0.000112	0.000064	0.000113	0.000193	0.000166
PULP & PAPER IND	30	0.089332	0.036973	0.017104	0.063756	0.068596	0.054038
PRINTING & PUBL IND	31	0.013273	0.011519	0.005043	0.012839	0.025131	0.022797
PRIMARY MET IND	32	0.031335	0.023116	0.018088	0.018755	0.034913	0.025481
METAL FAB IND	33	0.055846	0.034390	0.023828	0.023516	0.065116	0.040536
MACHINERY IND	34	0.027584	0.032944	0.036044	0.034805	0.026332	0.031447
TRANSP EQUIP IND	35	0.006509	0.006063	0.002713	0.006370	0.010972	0.009890
ELECTR APPL IND	36	0.006584	0.006294	0.004509	0.006749	0.010413	0.009688
CEMENT MFR IND	37	0.001325	0.000961	0.000797	0.000944	0.004717	0.003498
CONCRETE PROD IND	38	0.003492	0.002139	0.001851	0.002215	0.017013	0.012283
READY MIX MFR IND	39	0.003071	0.001881	0.001628	0.001949	0.014965	0.010804
OTH NON-METAL IND	40	0.002376	0.001455	0.001259	0.001507	0.011575	0.008357
PETROLEUM & COAL IND	41	0.049828	0.039405	0.034214	0.040402	0.024687	0.021534
FERTILIZER MFR IND	42	0.017848	0.048770	0.040124	0.043501	0.008767	0.025378
CHEMICAL & PET IND	43	0.057145	0.095653	0.062019	0.062418	0.046065	0.047233
MISC MFR IND	44	0.014555	0.009545	0.036596	0.014046	0.021462	0.018177
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.023807	0.022924	0.017615	0.020833	0.015502	0.016415
TRANSP SERV IND	47	0.084581	0.127623	0.085116	0.099803	0.052039	0.041020
STORAGE SERV IND	48	0.003205	0.046555	0.011873	0.002413	0.032412	0.019947
COMMUNIC SERV IND	49	0.014754	0.018693	0.012797	0.016881	0.018522	0.017149
ELECTRICAL POWER	50	0.031615	0.021110	0.018640	0.019426	0.010664	0.015787
GAS DISTRIB IND	51	0.013323	0.010600	0.011775	0.009815	0.008353	0.008022
WATER & OTH IND	52	0.000331	0.000442	0.001084	0.000446	0.002144	0.004729
WHOLESALE TRADE	53	0.052773	0.082053	0.047244	0.060390	0.058429	0.047998
RETAIL TRADE	54	0.011534	0.009312	0.010078	0.010255	0.012112	0.010156
FINANCE	55	0.059053	0.055256	0.040344	0.061678	0.049838	0.036781
REAL ESTATE RENTAL	56	0.013957	0.032262	0.039895	0.030411	0.006432	0.015403
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000005	0.000003	0.000003	0.000004	0.000005	0.000003
ACCOM & FOOD SERV	59	0.007268	0.006287	0.005564	0.007094	0.014184	0.012958
BUSINESS SERV IND	60	0.026788	0.018842	0.021239	0.025109	0.034863	0.021877
PERSONAL SERV IND	61	0.026958	0.019484	0.012409	0.019876	0.021561	0.013649
SUM		2.730044	2.653787	2.166251	2.434552	2.021912	1.930963

TABLE C-5 IMPACT MULTIPLIERS (CONTINUED)

PAGE

		OTH FOODS, NES 25	TIRES & TUBES 26	OTH RUBBER PROD 27	LEATHER PROD 28	TEXTILE PROD 29	HOSIERY & KNITTED 30
WHEAT PRODUCERS	1	0.116934	0.000736	0.000736	0.001122	0.000777	0.000573
BARLEY PRODUCERS	2	0.052479	0.000793	0.000793	0.006504	0.000733	0.000629
OIL SEEDS PRDRS	3	0.000003	0.000001	0.000001	0.000001	0.000001	0.000001
OTH GRAIN PRDRS	4	0.146586	0.000812	0.000812	0.009108	0.000816	0.001504
FORAGE PRDRS	5	0.008760	0.001000	0.001000	0.014297	0.000836	0.000784
LIVESTOCK PRDRS	6	0.006008	0.002807	0.002807	0.044247	0.002300	0.002161
POULTRY & EGG PRDRS	7	0.031513	0.000329	0.000329	0.002172	0.000313	0.000266
DAIRY PRODUCERS	8	0.038269	0.000690	0.000690	0.001419	0.000671	0.000582
OTH AG PRDRS	9	0.000419	0.000876	0.000876	0.000825	0.000832	0.000707
FORESTRY PRDRS	10	0.011815	0.016394	0.016394	0.009283	0.012118	0.009955
FISHING, H & T PRDRS	11	0.001994	0.000098	0.000098	0.000784	0.000349	0.001203
COAL MINING IND	12	0.001406	0.001351	0.001351	0.001188	0.000722	0.001034
CRUDE OIL & GAS IND	13	0.028902	0.011578	0.011578	0.008286	0.009327	0.007460
OTH MINING IND	14	0.013291	0.008791	0.008791	0.006870	0.006349	0.004488
MEAT PROC IND	15	0.006295	0.003367	0.003367	0.062745	0.002666	0.002418
DAIRY INDUSTRY	16	0.007144	0.001326	0.001326	0.001397	0.001264	0.001122
FEEDS MFR IND	17	0.018113	0.000370	0.000370	0.002665	0.000327	0.000284
FLOUR GRP BAKERY IND	18	0.010723	0.001385	0.001385	0.001025	0.001332	0.000998
VEGETABLE OIL MILLS	19	0.000007	0.000002	0.000002	0.000002	0.000002	0.000001
SOFT DRINKS MFR IND	20	0.000244	0.000239	0.000239	0.000231	0.000228	0.000206
BEERS & ALC MFR IND	21	0.003798	0.000716	0.000716	0.000681	0.000684	0.000609
OTH FOOD MFR IND	22	1.061768	0.001877	0.001877	0.003281	0.002351	0.001619
RUBBER PROD IND	23	0.004666	1.017623	1.017623	0.065552	0.006180	0.006586
LEATHER PROD IND	24	0.000495	0.004330	0.004330	1.267856	0.000514	0.001546
TEXTILE PROD IND	25	0.010246	0.090961	0.090961	0.057589	1.356074	0.588534
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	1.004781
CLOTHING IND	27	0.000329	0.001202	0.001202	0.007094	0.003499	0.067042
WOOD PROD IND	28	0.017117	0.007660	0.007660	0.009264	0.005523	0.003930
FURNITURE IND	29	0.000151	0.000147	0.000147	0.000132	0.000243	0.000157
PULP & PAPER IND	30	0.060935	0.092913	0.092913	0.050050	0.068752	0.056793
PRINTING & PUBL IND	31	0.017183	0.018114	0.018114	0.017294	0.016538	0.016520
PRIMARY MET IND	32	0.032104	0.022292	0.022292	0.022424	0.019787	0.014020
METAL FAB IND	33	0.057569	0.029337	0.029337	0.036851	0.023790	0.017207
MACHINERY IND	34	0.030312	0.016559	0.016559	0.016313	0.015617	0.013525
TRANSP EQUIP IND	35	0.008006	0.008202	0.008202	0.007171	0.007254	0.006459
ELECTR APPL IND	36	0.008343	0.007348	0.007348	0.007220	0.007651	0.006463
CEMENT MFR IND	37	0.001356	0.001127	0.001127	0.000714	0.000946	0.000680
CONCRETE PROD IND	38	0.003963	0.003413	0.003413	0.001960	0.002593	0.001825
READY MIX MFR IND	39	0.003486	0.003002	0.003002	0.001724	0.002281	0.001605
OTH NON-METAL IND	40	0.002695	0.002322	0.002322	0.001334	0.001764	0.001242
PETROLEUM & COAL IND	41	0.028863	0.012921	0.012921	0.009657	0.009628	0.008388
FERTILIZER MFR IND	42	0.032310	0.001851	0.001851	0.003369	0.001801	0.001139
CHEMICAL & REL IND	43	0.055291	0.324510	0.324510	0.094431	0.311363	0.158355
MISC MFR IND	44	0.035242	0.021331	0.021331	0.035170	0.057850	0.033216
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.018299	0.013690	0.013690	0.011748	0.015613	0.011550
TRANSP SERV IND	47	0.082948	0.053746	0.053746	0.041918	0.050641	0.041779
STORAGE SERV IND	48	0.003147	0.012998	0.012998	0.004226	0.002163	0.001727
COMMUNIC SERV IND	49	0.017267	0.019343	0.019343	0.018674	0.020177	0.017966
ELECTRICAL POWER	50	0.017130	0.014680	0.014680	0.010687	0.007885	0.009619
GAS DISTRIB IND	51	0.013638	0.007460	0.007460	0.004133	0.006021	0.004962
WATER & OTH IND	52	0.001548	0.001447	0.001447	0.000600	0.000456	0.001160
WHOLESALE TRADE	53	0.066742	0.054159	0.054159	0.060160	0.075248	0.050959
RETAIL TRADE	54	0.009993	0.007264	0.007264	0.007359	0.007037	0.007846
FINANCE	55	0.053440	0.049892	0.049892	0.049649	0.053376	0.052801
REAL ESTATE RENTAL	56	0.024347	0.000243	0.000243	0.002184	0.000231	0.000261
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000004	0.000004	0.000004	0.000005	0.000004	0.000004
ACCOM & FOOD SERV	59	0.009613	0.009603	0.009603	0.009107	0.009147	0.008178
BUSINESS SERV IND	60	0.026899	0.023114	0.023114	0.025549	0.021732	0.023329
PERSONAL SERV IND	61	0.024643	0.024724	0.024724	0.025172	0.023282	0.021662
SUM		2.346873	2.035074	2.035074	2.171441	2.259789	2.304123

TABLE C-5 IMPACT MULTIPLIERS (CONTINUED)

		CLOTHING	LUMBER & PLYWOOD	WOOD PROD NES	FURNIT & FIX	PULP & PAPER	PRINTING & PUB
		31	32	33	34	35	36
WHEAT PRODUCERS	1	0.000751	0.000691	0.000691	0.000534	0.000705	0.000500
BARLEY PRODUCERS	2	0.000951	0.000990	0.000990	0.000619	0.001139	0.000693
OIL SEEDS PRDRS	3	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001
OTH GRAIN PRDRS	4	0.017945	0.001002	0.001002	0.000621	0.001126	0.000684
FORAGE PRDRS	5	0.001350	0.001264	0.001264	0.000776	0.001485	0.000909
LIVESTOCK PRDRS	6	0.003412	0.003617	0.003617	0.002164	0.004303	0.002564
POULTRY & EGG PRDRS	7	0.000413	0.000373	0.000373	0.000258	0.000392	0.000279
DAIRY PRODUCERS	8	0.000924	0.000734	0.000734	0.000564	0.000749	0.000606
OTH AG PRDRS	9	0.000450	0.001038	0.001038	0.000746	0.001007	0.000798
FORESTRY PRDRS	10	0.015242	0.119962	0.119962	0.014758	0.201322	0.043065
FISHING, H & T PRDRS	11	0.020733	0.000075	0.000075	0.000105	0.000071	0.000055
COAL MINING IND	12	0.001634	0.001073	0.001073	0.000906	0.000946	0.000908
CRUDE OIL & GAS IND	13	0.008597	0.014275	0.014275	0.007885	0.027092	0.009294
OTH MINING IND	14	0.005426	0.015417	0.015417	0.019047	0.012812	0.006625
MEAT PROC IND	15	0.003845	0.004391	0.004391	0.002449	0.005372	0.002922
DAIRY INDUSTRY	16	0.001826	0.001380	0.001380	0.001059	0.001397	0.001186
FEEDS MFR IND	17	0.000442	0.000837	0.000837	0.000298	0.001197	0.000438
FLOUR CER BAKERY IND	18	0.001340	0.000986	0.000986	0.000678	0.001037	0.000858
VEGETABLE OIL MILLS	19	0.000002	0.000002	0.000002	0.000001	0.000002	0.000002
SOFT DRINKS MFR IND	20	0.000340	0.000256	0.000256	0.000204	0.000242	0.000218
BEERS & ALC MFR IND	21	0.000996	0.000749	0.000749	0.000599	0.000712	0.000638
OTH FOOD MFR IND	22	0.002003	0.002110	0.002110	0.001391	0.002009	0.001323
RUBBER PROD IND	23	0.005384	0.004406	0.004406	0.034165	0.004490	0.003597
LEATHER PROD IND	24	0.000668	0.000530	0.000530	0.001135	0.000500	0.000422
TEXTILE PROD IND	25	0.214394	0.006324	0.006324	0.216345	0.010450	0.012458
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	1.320245	0.000339	0.000339	0.000736	0.000333	0.000308
WOOD PROD IND	28	0.004283	1.313009	1.313009	0.089787	0.009569	0.004545
FURNITURE IND	29	0.000183	0.000188	0.000188	1.012125	0.000144	0.000119
PULP & PAPER IND	30	0.087861	0.026723	0.026723	0.040149	1.184956	0.252178
PRINTING & PUBL IND	31	0.023833	0.018028	0.018028	0.014566	0.019539	1.040562
PRIMARY MET IND	32	0.016980	0.057137	0.057137	0.074907	0.022097	0.019623
METAL FAB IND	33	0.022619	0.117110	0.117110	0.095444	0.030661	0.017362
MACHINERY IND	34	0.021828	0.018869	0.018869	0.014856	0.018073	0.014680
TRANSP EQUIP IND	35	0.010578	0.008356	0.008356	0.006469	0.008491	0.006864
ELECTR APPL IND	36	0.010093	0.008431	0.008431	0.007739	0.007721	0.006917
CEMENT MFR IND	37	0.000745	0.001850	0.001850	0.001352	0.002782	0.001006
CONCRETE PROD IND	38	0.002080	0.006011	0.006011	0.004410	0.009414	0.002949
READY MIX MFR IND	39	0.001829	0.005287	0.005287	0.003879	0.008281	0.002594
OTH NON-METAL IND	40	0.001415	0.004089	0.004089	0.003000	0.006405	0.002006
PETROLEUM & COAL IND	41	0.009510	0.020777	0.020777	0.009487	0.029235	0.010501
FERTILIZER MFR IND	42	0.002486	0.000665	0.000665	0.000728	0.000998	0.000586
CHEMICAL & REL IND	43	0.075365	0.034555	0.034555	0.084751	0.100536	0.047243
MISC MFR IND	44	0.032919	0.040047	0.040047	0.081403	0.036743	0.019157
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.011701	0.016202	0.016202	0.012174	0.018655	0.013697
TRANSP SERV IND	47	0.040248	0.056336	0.056336	0.042851	0.088245	0.046134
STORAGE SERV IND	48	0.001982	0.002321	0.002321	0.002713	0.001624	0.001375
COMMUNIC SERV IND	49	0.020416	0.019492	0.019492	0.018561	0.015337	0.036811
ELECTRICAL POWER	50	0.020256	0.012690	0.012690	0.010102	0.011166	0.011149
GAS DISTRIB IND	51	0.005374	0.005220	0.005220	0.005238	0.020898	0.006597
WATER & OTH IND	52	0.000273	0.000242	0.000242	0.000341	0.001302	0.000366
WHOLESALE TRADE	53	0.046575	0.074487	0.074487	0.065404	0.040228	0.031499
RETAIL TRADE	54	0.012003	0.009102	0.009102	0.007518	0.009156	0.008771
FINANCE	55	0.065140	0.053763	0.053763	0.046633	0.051181	0.051577
REAL ESTATE RENTAL	56	0.001657	0.000288	0.000288	0.000186	0.000325	0.000203
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000005	0.000004	0.000004	0.000004	0.000004	0.000005
ACCOM & FOOD SERV	59	0.013403	0.010053	0.010053	0.008041	0.009544	0.008575
BUSINESS SERV IND	60	0.023420	0.023021	0.023021	0.022851	0.024674	0.040242
PERSONAL SERV IND	61	0.029275	0.024002	0.024002	0.022464	0.024306	0.016196
SUM		2.245624	2.171158	2.171158	2.139111	2.093586	1.813426

TABLE C-5 IMPACT MULTIPLIERS (CONTINUED)

		IRON & STEEL 37	OTH PRIM METAL 38	METAL FAB PROD 39	MACHINERY 40	VEHICLES & OTH TRANS 41	ELECT APPLIANCES 42
WHEAT PRODUCERS	1	0.000624	0.000624	0.000572	0.000609	0.000551	0.000560
BARLEY PRODUCERS	2	0.000748	0.000748	0.000659	0.000664	0.000671	0.000639
OIL SEEDS PRDRS	3	0.000001	0.000001	0.000001	0.000001	0.000001	0.000001
OTH GRAIN PRDRS	4	0.000732	0.000732	0.000685	0.000723	0.000663	0.000631
FORAGE PRDRS	5	0.000949	0.000949	0.000816	0.000796	0.000859	0.000796
LIVESTOCK PRDRS	6	0.002631	0.002631	0.002252	0.002189	0.002389	0.002208
POULTRY & EGG PRDRS	7	0.000324	0.000324	0.000291	0.000295	0.000286	0.000273
DAIRY PRODUCERS	8	0.000729	0.000729	0.000642	0.000639	0.000643	0.000605
OTH AG PRDRS	9	0.000961	0.000961	0.000820	0.000810	0.000843	0.000795
FORESTRY PRDRS	10	0.005393	0.005393	0.004903	0.004454	0.009591	0.010233
FISHING, H & T PRDRS	11	0.000077	0.000077	0.000068	0.000068	0.000073	0.000066
COAL MINING IND	12	0.002237	0.002237	0.001242	0.000842	0.001111	0.001123
CRUDE OIL & GAS IND	13	0.017388	0.017388	0.009790	0.008232	0.009275	0.009420
OTH MINING IND	14	0.300454	0.300454	0.107700	0.051318	0.045076	0.042528
MEAT PROC IND	15	0.002949	0.002949	0.002547	0.002486	0.002659	0.002521
DAIRY INDUSTRY	16	0.001442	0.001442	0.001245	0.001214	0.001269	0.001186
FEEDS MFR IND	17	0.000320	0.000320	0.000282	0.000281	0.000304	0.000292
FLOUR CER BAKERY IND	18	0.001068	0.001068	0.000908	0.000886	0.000936	0.000980
VEGETABLE OIL MILLS	19	0.000003	0.000003	0.000002	0.000002	0.000002	0.000002
SOFT DRINKS MFR IND	20	0.000269	0.000269	0.000232	0.000226	0.000234	0.000219
BEERS & ALC MFR IND	21	0.000787	0.000787	0.000680	0.000663	0.000686	0.000645
OTH FOOD MFR IND	22	0.001575	0.001575	0.001769	0.002137	0.001421	0.001440
RUBBER PROD IND	23	0.006984	0.006984	0.006561	0.022569	0.042336	0.050497
LEATHER PROD IND	24	0.000535	0.000535	0.000450	0.000525	0.000625	0.000628
TEXTILE PROD IND	25	0.004397	0.004397	0.003878	0.005979	0.026665	0.010274
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.000352	0.000352	0.000303	0.000311	0.000387	0.000332
WOOD PROD IND	28	0.009231	0.009231	0.011302	0.008141	0.058464	0.007562
FURNITURE IND	29	0.001779	0.001779	0.000698	0.000510	0.014156	0.000873
PULP & PAPER IND	30	0.026790	0.026790	0.023006	0.022053	0.026261	0.056519
PRINTING & PUBL IND	31	0.019037	0.019037	0.016401	0.015971	0.016585	0.015781
PRIMARY MFT IND	32	1.296371	1.296371	0.457955	0.200970	0.162869	0.169584
METAL FAB IND	33	0.078656	0.078656	1.163942	0.245667	0.142026	0.204721
MACHINERY IND	34	0.036150	0.036150	0.028954	1.140251	0.039544	0.019846
TRANSP EQUIP IND	35	0.009068	0.009068	0.008267	0.017529	1.115026	0.007606
ELECTR APPL IND	36	0.009031	0.009031	0.012785	0.066127	0.051264	1.252823
CEMENT MFR IND	37	0.002891	0.002891	0.002077	0.001352	0.002550	0.001736
CONCRETE PROD IND	38	0.009266	0.009266	0.006910	0.004283	0.008863	0.005565
READY MIX MFR IND	39	0.008150	0.008150	0.006078	0.003768	0.007796	0.004895
OTH NON-METAL IND	40	0.006304	0.006304	0.004701	0.002914	0.006030	0.003786
PETROLEUM & COAL IND	41	0.021192	0.021192	0.011978	0.010537	0.011137	0.009779
FERTILIZER MFR IND	42	0.000775	0.000775	0.000592	0.000564	0.000640	0.000891
CHEMICAL & REL IND	43	0.049350	0.049350	0.038144	0.037203	0.054807	0.115850
MISC MFR IND	44	0.011490	0.011490	0.012778	0.013554	0.020888	0.020238
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.027286	0.027286	0.015727	0.013518	0.013547	0.016357
TRANSP SERV IND	47	0.072540	0.072540	0.049787	0.046515	0.051411	0.058499
STORAGE SERV IND	48	0.002610	0.002610	0.002082	0.002396	0.002600	0.002558
COMMUNIC SERV IND	49	0.018958	0.018958	0.018998	0.021346	0.020937	0.024935
ELECTRICAL POWER	50	0.026630	0.026630	0.014818	0.010085	0.012556	0.013417
GAS DISTRIB IND	51	0.012933	0.012933	0.007170	0.005526	0.006450	0.005983
WATER & OTH IND	52	0.000700	0.000700	0.000455	0.000431	0.000694	0.000573
WHOLESALE TRADE	53	0.084474	0.084474	0.064492	0.073253	0.071205	0.066164
RETAIL TRADE	54	0.009418	0.009418	0.007740	0.007390	0.008847	0.007310
FINANCE	55	0.056871	0.056871	0.040135	0.039830	0.038472	0.063210
REAL ESTATE RENTAL	56	0.000222	0.000222	0.000199	0.000204	0.000200	0.000191
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000005	0.000005	0.000004	0.000005	0.000004	0.000005
ACCOM & FOOD SERV	59	0.010578	0.010578	0.009129	0.008883	0.009220	0.008665
BUSINESS SERV IND	60	0.038723	0.038723	0.036494	0.027561	0.024292	0.030523
PERSONAL SERV IND	61	0.024448	0.024448	0.013963	0.024571	0.023416	0.025238
SUM		2.335441	2.335441	2.237050	2.183812	2.192298	2.359574

TABLE C-5 IMPACT MULTIPLIERS (CONTINUED)

PAGE

		CEMENT	OTH NON-MET	PETROLEUM	FERTILIZER	CHEMICAL	MISC MFR
		43	44	45	46	47	48
WHEAT PRODUCERS	1	0.000703	0.000596	0.000416	0.000651	0.001390	0.000628
BARLEY PRODUCERS	2	0.000767	0.000733	0.000495	0.000556	0.000956	0.000704
OIL SEEDS PRDRS	3	0.000001	0.000001	0.000003	0.000002	0.000001	0.000001
OTH GRAIN PRDRS	4	0.000867	0.000728	0.000488	0.000809	0.001023	0.000709
FORAGE PRDRS	5	0.000909	0.000934	0.000628	0.000608	0.000999	0.000895
LIVESTOCK PRDRS	6	0.002499	0.002591	0.001738	0.001688	0.002750	0.002471
POULTRY & EGG PRDRS	7	0.000346	0.000318	0.000217	0.000323	0.000386	0.000298
DAIRY PRODUCERS	8	0.000734	0.000712	0.000487	0.000484	0.000795	0.000640
OTH AG PRDRS	9	0.000912	0.000941	0.000634	0.000394	0.000919	0.000823
FORESTRY PRDRS	10	0.013767	0.009312	0.004980	0.013823	0.035633	0.013860
FISHING, H & T PRDRS	11	0.000075	0.000075	0.000050	0.000053	0.000059	0.000067
COAL MINING IND	12	0.001985	0.001316	0.002188	0.002142	0.001517	0.000955
CRUDE OIL & GAS IND	13	0.016383	0.016095	0.592884	0.233184	0.019947	0.009151
OTH MINING IND	14	0.033941	0.106213	0.030927	0.030835	0.008630	0.019349
MEAT PROC IND	15	0.002908	0.002925	0.001970	0.001799	0.003233	0.002913
DAIRY INDUSTRY	16	0.001373	0.001405	0.000958	0.000678	0.001441	0.001240
FEEDS MFR IND	17	0.000360	0.000331	0.000220	0.000301	0.000485	0.000330
FLOUR CER BAKERY IND	18	0.001035	0.001033	0.000764	0.000660	0.002909	0.001143
VEGETABLE OIL MILLS	19	0.000002	0.000002	0.000006	0.000004	0.000002	0.000001
SOFT DRINKS MFR IND	20	0.000254	0.000262	0.000178	0.000113	0.000236	0.000227
BEERS & ALC MFR IND	21	0.000747	0.000769	0.000520	0.000278	0.000758	0.000672
OTH FOOD MFR IND	22	0.002731	0.001601	0.001072	0.003551	0.003501	0.001655
RUBBER PROD IND	23	0.004190	0.005954	0.003402	0.002854	0.004436	0.005678
LEATHER PROD IND	24	0.000514	0.000529	0.000352	0.000267	0.000452	0.001533
TEXTILE PROD IND	25	0.005064	0.003471	0.002292	0.002332	0.005824	0.015071
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.000329	0.000340	0.000228	0.000139	0.000309	0.000326
WOOD PROD IND	28	0.005100	0.005770	0.009490	0.009248	0.009212	0.015669
FURNITURE IND	29	0.000199	0.000192	0.000170	0.000079	0.000136	0.000261
PULP & PAPER IND	30	0.078717	0.052031	0.024493	0.076891	0.205824	0.072764
PRINTING & PUBL IND	31	0.018112	0.018519	0.012562	0.016761	0.018498	0.016425
PRIMARY MET IND	32	0.017486	0.048651	0.033165	0.022944	0.019858	0.065595
METAL FAB IND	33	0.021507	0.043288	0.044690	0.028100	0.030366	0.073340
MACHINERY IND	34	0.017726	0.021007	0.021105	0.012081	0.017545	0.016767
TRANSP EQUIP IND	35	0.007971	0.008392	0.009705	0.003501	0.008219	0.007110
ELECTR APPL IND	36	0.009179	0.008061	0.005940	0.003677	0.007750	0.025429
CEMENT MFR IND	37	1.004675	0.103504	0.001863	0.001346	0.001120	0.002382
CONCRETE PROD IND	38	0.010571	0.394590	0.002777	0.002944	0.003168	0.008334
READY MIX MFR IND	39	0.009298	0.347080	0.003322	0.002589	0.002734	0.007331
OTH NON-METAL IND	40	0.007192	0.268461	0.002570	0.002003	0.002115	0.005670
PETROLEUM & COAL IND	41	0.011671	0.018850	1.012140	0.030955	0.015961	0.010004
FERTILIZER MFR IND	42	0.000888	0.000682	0.000623	1.000742	0.006221	0.001300
CHEMICAL & REL IND	43	0.071175	0.055976	0.076323	0.099456	1.278711	0.203017
MISC MFR IND	44	0.027669	0.015387	0.013726	0.011414	0.016169	1.061562
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.015574	0.017583	0.052262	0.033737	0.017908	0.011894
TRANSP SERV IND	47	0.057566	0.069795	0.025381	0.056235	0.072731	0.039598
STORAGE SERV IND	48	0.001437	0.001958	0.001199	0.001338	0.001778	0.001702
COMMUNIC SERV IND	49	0.016260	0.016945	0.012780	0.020325	0.020409	0.018702
ELECTRICAL POWER	50	0.024303	0.015731	0.014141	0.026239	0.014589	0.011143
GAS DISTRIB IND	51	0.025695	0.012374	0.008459	0.044450	0.020323	0.006960
WATER & OTH IND	52	0.000726	0.000478	0.000479	0.001256	0.000734	0.001062
WHOLESALE TRADE	53	0.033083	0.054921	0.026819	0.038267	0.048620	0.048581
RETAIL TRADE	54	0.007534	0.009005	0.005925	0.007564	0.007802	0.007074
FINANCE	55	0.042087	0.041101	0.149796	0.081580	0.057507	0.042262
REAL ESTATE RENTAL	56	0.000237	0.000218	0.000148	0.000193	0.000320	0.000213
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000004	0.000005	0.000005	0.000005	0.000004	0.000004
ACCOM & FOOD SERV	59	0.009999	0.010301	0.006971	0.009265	0.010082	0.009023
BUSINESS SERV IND	60	0.019480	0.032742	0.042776	0.039273	0.022936	0.019226
PERSONAL SERV IND	61	0.027484	0.030168	0.018014	0.015549	0.024674	0.022421
SUM		1.694087	1.882932	2.368953	1.998469	2.662025	1.915149

TABLE C-5 IMPACT MULTIPLIERS (CONTINUED)

		NEW CONSTRUCT	REPAIR CONSTRUCT	TRANSP SERV	STORAGE SERV	COMMUNIC	ELECT POWER
		49	50	51	52	53	54
WHEAT PRODUCERS	1	0.000415	0.000626	0.000219	0.000537	0.000218	0.000170
BARLEY PRODUCERS	2	0.000576	0.000846	0.000331	0.000751	0.000359	0.000272
OIL SEEDS PRDRS	3	0.000001	0.000051	0.000001	0.000003	0.000002	0.000003
OTH GRAIN PRDRS	4	0.000578	0.000871	0.000341	0.000754	0.000377	0.000284
FORAGE PRDRS	5	0.000805	0.001223	0.000499	0.001042	0.000560	0.000418
LIVESTOCK PRDRS	6	0.002254	0.003504	0.001836	0.002935	0.001621	0.001209
POULTRY & EGG PRDRS	7	0.000330	0.000318	0.000117	0.000308	0.000123	0.000095
DAIRY PRODUCERS	8	0.000573	0.000704	0.000271	0.000704	0.000286	0.000220
OTH AG PRDRS	9	0.000736	0.000797	0.000350	0.000926	0.000368	0.000278
FORESTRY PRDRS	10	0.011977	0.017908	0.001711	0.005022	0.002024	0.001589
FISHING, H & T PRDRS	11	0.000048	0.000060	0.000029	0.000076	0.000217	0.000023
COAL MINING IND	12	0.001292	0.001178	0.001128	0.001053	0.000415	0.079535
CRUDE OIL & GAS IND	13	0.015349	0.027245	0.020541	0.011076	0.003903	0.046027
OTH MINING IND	14	0.056232	0.087020	0.003860	0.007405	0.004706	0.007318
MEAT PROC IND	15	0.001893	0.002665	0.001082	0.002833	0.001133	0.000863
DAIRY INDUSTRY	16	0.000853	0.001239	0.000523	0.001385	0.000547	0.000418
FEEDS MFR IND	17	0.000325	0.000420	0.000131	0.000329	0.000144	0.000110
FLOUR GRP BAKERY IND	18	0.000640	0.001029	0.000374	0.000964	0.000387	0.000297
VEGETABLE OIL MILLS	19	0.000001	0.000116	0.000062	0.000006	0.000004	0.000006
SOFT DRINKS MFR IND	20	0.000159	0.000243	0.000098	0.000260	0.000103	0.000079
BEERS & ALC MFR IND	21	0.000465	0.000633	0.000285	0.000756	0.000298	0.000227
OTH FOOD MFR IND	22	0.001026	0.001525	0.000539	0.001378	0.000553	0.000427
RUBBER PROD IND	23	0.009579	0.014887	0.010926	0.004683	0.003140	0.001811
LEATHER PROD IND	24	0.000436	0.000486	0.000230	0.000517	0.000214	0.000156
TEXTILE PROD IND	25	0.009907	0.005049	0.002256	0.009503	0.002251	0.001038
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.000264	0.000344	0.000162	0.000356	0.000170	0.000126
WOOD PROD IND	28	0.068449	0.106382	0.003702	0.009450	0.005667	0.007660
FURNITURE IND	29	0.001675	0.000511	0.000199	0.000145	0.000080	0.000063
PULP & PAPER IND	30	0.026595	0.029711	0.000188	0.024765	0.009013	0.005400
PRINTING & PUBL IND	31	0.011407	0.014549	0.010863	0.018181	0.014820	0.006120
PRIMARY MET IND	32	0.170642	0.306717	0.011045	0.025164	0.016735	0.018606
METAL FAB IND	33	0.151437	0.174638	0.010765	0.022671	0.014635	0.012806
MACHINERY IND	34	0.034359	0.147415	0.008247	0.022134	0.010545	0.013493
TRANSP EQUIP IND	35	0.007333	0.008352	0.014427	0.008310	0.003606	0.002883
ELECTR APPL IND	36	0.052011	0.014794	0.007648	0.007883	0.027083	0.002819
CEMENT MFR IND	37	0.011570	0.033195	0.000691	0.001979	0.001212	0.001674
CONCRETE PROD IND	38	0.024312	0.060397	0.001527	0.003932	0.002369	0.003132
READY MIX MFR IND	39	0.021385	0.053125	0.001343	0.003458	0.002084	0.002755
OTH NON-METAL IND	40	0.016541	0.041091	0.001039	0.002675	0.001612	0.002131
PETROLEUM & COAL IND	41	0.023315	0.041522	0.033705	0.016721	0.005720	0.009375
FERTILIZER MFR IND	42	0.000491	0.000743	0.000239	0.000513	0.000244	0.000181
CHEMICAL & REL IND	43	0.037345	0.059351	0.012824	0.019884	0.010734	0.007306
MISC MFR IND	44	0.021765	0.049320	0.004550	0.015501	0.006022	0.005266
MFR CONSTR IND	45	1.000000	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.010932	1.016154	0.017061	0.055519	0.034594	0.049912
TRANSP SERV IND	47	0.052024	0.089378	1.026973	0.074977	0.056856	0.021692
STORAGE SERV IND	48	0.002199	0.004219	0.001071	1.001520	0.000798	0.000677
COMMUNIC SERV IND	49	0.012570	0.019937	0.009746	0.020491	1.044310	0.068204
ELECTRICAL POWER	50	0.008541	0.013690	0.013754	0.012955	0.005114	1.007421
GAS DISTRIB IND	51	0.005451	0.009741	0.004029	0.003532	0.001528	0.045102
WATER & OTH IND	52	0.000311	0.000467	0.000557	0.001332	0.000174	0.000199
WHOLESALE TRADE	53	0.071843	0.102346	0.027576	0.032358	0.013262	0.014060
RETAIL TRADE	54	0.016658	0.029679	0.012303	0.011184	0.015090	0.011016
FINANCE	55	0.041809	0.043635	0.019747	0.057506	0.039178	0.050122
REAL ESTATE RENTAL	56	0.000173	0.000264	0.000101	0.000225	0.000110	0.000083
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000006	0.000004	0.000002	0.000005	0.000004	0.000002
ACCOM.& FOOD SERV	59	0.006247	0.007912	0.003830	0.010143	0.003992	0.003022
BUSINESS SERV IND	60	0.042511	0.025528	0.012430	0.021723	0.032703	0.012546
PERSONAL SERV IND	61	0.026262	0.019861	0.011386	0.031491	0.015026	0.008892
SUM		2.094876	2.734205	1.339005	1.594314	1.419038	1.478009

TABLE C-5 IMPACT MULTIPLIERS (CONTINUED)

PAGE

		GAS PIPE SERV 55	WATER & OTH 56	WHOLESALE 57	RETAIL 58	FINANCE & OTH 59	REAL ESTATE 60
WHEAT PRODUCERS	1	0.000163	0.000679	0.001145	0.000813	0.000229	0.000342
BARLEY PRODUCERS	2	0.000214	0.001034	0.000825	0.007765	0.000301	0.000409
OIL SEEDS PRDRS	3	0.000002	0.000006	0.000001	0.000001	0.000004	0.000099
OTH GRAIN PRDRS	4	0.000210	0.001064	0.000596	0.009734	0.000297	0.000378
FORAGE PRDRS	5	0.000281	0.001545	0.000794	0.018128	0.000397	0.000517
LIVESTOCK PRDRS	6	0.000778	0.004440	0.002211	0.056293	0.001104	0.001405
POULTRY & EGG PRDPS	7	0.000095	0.000373	0.000262	0.000301	0.000131	0.000297
DAIRY PRODUCERS	8	0.000214	0.000864	0.000588	0.001449	0.000297	0.000455
OTH AG PRDRS	9	0.000283	0.001196	0.000890	0.000774	0.000392	0.000325
FORESTRY PRDRS	10	0.001209	0.005317	0.004385	0.005747	0.002188	0.002579
FISHING, H & T PRDRS	11	0.000023	0.000089	0.000066	0.000116	0.000032	0.000034
COAL MINING IND	12	0.000380	0.001602	0.000657	0.001730	0.000312	0.000410
CRUDE OIL & GAS IND	13	0.002366	0.088853	0.009732	0.010356	0.003575	0.003909
OTH MINING IND	14	0.003382	0.015760	0.003962	0.004382	0.007163	0.007851
MEAT PROC IND	15	0.000861	0.003432	0.002449	0.003705	0.001190	0.001527
DAIRY INDUSTRY	16	0.000424	0.001667	0.001167	0.001187	0.000583	0.000687
FEEDS MFR IND	17	0.000093	0.000424	0.000262	0.002126	0.000133	0.000285
FLOUR CER BAKERY IND	18	0.000296	0.001185	0.000969	0.000813	0.000413	0.000592
VEGETABLE OIL MILLS	19	0.000004	0.000013	0.000001	0.000003	0.000008	0.000224
SOFT DRINKS MFR IND	20	0.000080	0.000313	0.000218	0.000219	0.000110	0.000333
BEERS & ALC MFR IND	21	0.000231	0.000907	0.000638	0.000636	0.000316	0.000332
OTH FOOD MFR IND	22	0.000422	0.001683	0.001199	0.001228	0.000590	0.000634
RUBBER PROD IND	23	0.001440	0.005770	0.003283	0.004585	0.002326	0.002498
LEATHER PROD IND	24	0.000157	0.000783	0.000602	0.000427	0.000225	0.000109
TEXTILE PROD IND	25	0.000880	0.005019	0.005313	0.011811	0.001361	0.003542
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.000102	0.000485	0.000291	0.003400	0.000142	0.000078
WOOD PROD IND	28	0.004943	0.019029	0.007403	0.005336	0.011157	0.019184
FURNITURE IND	29	0.000047	0.000192	0.000106	0.000108	0.000077	0.000060
PULP & PAPER IND	30	0.004577	0.021526	0.022068	0.031195	0.007131	0.005266
PRINTING & PUBL IND	31	0.005512	0.021711	0.017228	0.016570	0.008683	0.003019
PRIMARY MET IND	32	0.011871	0.045042	0.013394	0.014206	0.025226	0.027807
METAL FAB IND	33	0.009071	0.038218	0.019012	0.018277	0.017329	0.020650
MACHINERY IND	34	0.008705	0.033168	0.013899	0.016304	0.015944	0.022259
TRANSP EQUIP IND	35	0.002373	0.009949	0.006609	0.006633	0.003306	0.001558
ELECTR APPL IND	36	0.002493	0.009425	0.006518	0.008722	0.003752	0.002652
CEMENT MFR IND	37	0.001076	0.003849	0.000506	0.000762	0.002461	0.002880
CONCRETE PROD IND	38	0.002035	0.007357	0.001279	0.001755	0.004580	0.004838
READY MIX MFR IND	39	0.001790	0.006471	0.001125	0.001544	0.004028	0.004256
OTH NON-METAL IND	40	0.001385	0.005005	0.000870	0.001194	0.003116	0.003292
PETROLEUM & COAL IND	41	0.003405	0.149335	0.014715	0.011518	0.604700	0.005713
FERTILIZER MFR IND	42	0.000148	0.000724	0.000509	0.003624	0.000214	0.000243
CHEMICAL & REL IND	43	0.005640	0.034454	0.016651	0.019818	0.009319	0.011678
MISC MFR IND	44	0.003714	0.015772	0.010466	0.009388	0.006406	0.011167
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.031734	0.112843	0.010014	0.017672	0.073793	0.078226
TRANSP SERV IND	47	0.007410	0.034648	0.029899	0.032295	0.012649	0.017201
STORAGE SERV IND	48	0.000449	0.002864	0.021280	0.011138	0.000727	0.011215
COMMUNIC SERV IND	49	0.009046	0.018226	0.029246	0.035436	0.015619	0.009977
ELECTRICAL POWER	50	0.034725	0.018118	0.007605	0.021655	0.003608	0.005027
GAS DISTRIB IND	51	1.000880	0.015199	0.002518	0.008775	0.002779	0.003434
WATER & OTH IND	52	0.000099	1.001268	0.000820	0.000523	0.000371	0.000582
WHOLESALE TRADE	53	0.007997	0.063531	1.019324	0.016787	0.014506	0.016094
RETAIL TRADE	54	0.002938	0.036867	0.008236	1.008311	0.004605	0.005661
FINANCE	55	0.030988	0.054975	0.068260	0.037953	1.065617	0.069385
REAL ESTATE RENTAL	56	0.000063	0.000315	0.000242	0.002645	0.000089	1.006420
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000002	0.000022	0.000005	0.000004	0.000003	0.000004
ACCOM.& FOOD SERV	59	0.003091	0.012147	0.008580	0.008583	0.004212	0.007316
BUSINESS SERV IND	60	0.011809	0.141371	0.029033	0.020611	0.014259	0.033447
PERSONAL SERV IND	61	0.010077	0.117194	0.026689	0.023570	0.017163	0.010598
SUM		1.204679	2.194909	1.456599	1.618616	1.381444	1.450068

TABLE C-5 IMPACT MULTIPLIERS (CONTINUED)

		EDUCATION	HEALTH SERV	ACCOM & FOOD	BUSINESS SERV	PERSONAL SERV
		61	62	63	64	65
WHEAT PRODUCERS	1	0.000945	0.000316	0.013266	0.000331	0.000499
BARLEY PRODUCERS	2	0.001236	0.000392	0.016677	0.000434	0.000645
OIL SEEDS PRDRS	3	0.000000	0.000000	0.000001	0.000000	0.000001
OTH GRAIN PRDRS	4	0.001210	0.000386	0.018697	0.000426	0.000625
FORAGE PRDRS	5	0.001594	0.000509	0.026650	0.000564	0.000816
LIVESTOCK PRDRS	6	0.004394	0.001414	0.076514	0.001559	0.002274
POULTRY & EGG PRDRS	7	0.000563	0.000169	0.021656	0.000195	0.000270
DAIRY PRODUCERS	8	0.001277	0.000382	0.018889	0.000443	0.000603
OTH AG PRDRS	9	0.001826	0.000512	0.009257	0.000601	0.001863
FORESTRY PRDRS	10	0.005608	0.002437	0.004672	0.001834	0.005380
FISHING, H & T PRDRS	11	0.000134	0.000049	0.003525	0.000049	0.000068
COAL MINING IND	12	0.000744	0.000313	0.000848	0.000220	0.001051
CRUDE OIL & GAS IND	13	0.015337	0.004380	0.010281	0.002540	0.008688
OTH MINING IND	14	0.005362	0.003051	0.004204	0.001908	0.004374
MEAT PROC IND	15	0.005176	0.001588	0.108232	0.001796	0.002555
DAIRY INDUSTRY	16	0.002559	0.000756	0.028769	0.000897	0.001192
FEEDS MFR IND	17	0.000532	0.000168	0.014108	0.000187	0.000373
FLOUR GRN BAKERY IND	18	0.001752	0.000570	0.025511	0.000609	0.000896
VEGETABLE OIL MILLS	19	0.000001	0.000001	0.000003	0.000001	0.000002
SOFT DRINKS MFR IND	20	0.000480	0.000141	0.003902	0.000166	0.000222
BEERS & ALC MFR IND	21	0.001401	0.000413	0.000462	0.000486	0.000650
OTH FOOD MFR IND	22	0.002493	0.000795	0.031243	0.000865	0.001271
RUBBER PROD IND	23	0.006815	0.002320	0.002423	0.002378	0.005052
LEATHER PROD IND	24	0.000865	0.000315	0.000259	0.000341	0.002547
TEXTILE PROD IND	25	0.004704	0.011301	0.017700	0.001915	0.018031
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.000604	0.000207	0.000994	0.000212	0.000336
WOOD PROD IND	28	0.002972	0.002300	0.004020	0.001747	0.016461
FURNITURE IND	29	0.000346	0.000070	0.000410	0.000074	0.000110
PULP & PAPER IND	30	0.031598	0.013207	0.025518	0.010048	0.023272
PRINTING & PUBL IND	31	0.060164	0.010188	0.009102	0.012659	0.016076
PRIMARY MET IND	32	0.017829	0.008167	0.011127	0.006730	0.014632
METAL FAB IND	33	0.025483	0.010172	0.013566	0.009165	0.021319
MACHINERY IND	34	0.028092	0.009067	0.013076	0.010047	0.014651
TRANSP EQUIP IND	35	0.014255	0.004214	0.004107	0.004875	0.006677
ELECTR APPL IND	36	0.014877	0.005166	0.004063	0.004772	0.006492
CEMENT MFR IND	37	0.000497	0.000381	0.000880	0.000248	0.000658
CONCRETE PROD IND	38	0.001478	0.000983	0.002337	0.000639	0.001604
READY MIX MFR IND	39	0.001300	0.000865	0.002056	0.000562	0.001411
OTH NON-METAL IND	40	0.001006	0.000669	0.001590	0.000435	0.001091
PETROLEUM & COAL IND	41	0.011965	0.006252	0.011502	0.003653	0.012463
FERTILIZER MFR IND	42	0.000830	0.000400	0.007444	0.000292	0.000663
CHEMICAL & REL IND	43	0.026078	0.039664	0.021469	0.009417	0.063011
MISC MFR IND	44	0.024228	0.027491	0.008715	0.005758	0.016229
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.006449	0.007241	0.015579	0.004753	0.013908
TRANSP SERV IND	47	0.052614	0.014938	0.030096	0.012371	0.025409
STORAGE SERV IND	48	0.001863	0.001021	0.021868	0.002962	0.001322
COMMUNIC SERV IND	49	0.019053	0.046520	0.013195	0.021386	0.016178
ELECTRICAL POWER	50	0.009122	0.003713	0.010413	0.002688	0.012883
GAS DISTRIB IND	51	0.007888	0.001946	0.005194	0.000934	0.003359
WATER & OTH IND	52	0.000175	0.000163	0.000476	0.000090	0.000298
WHOLESALE TRADE	53	0.025010	0.026854	0.035471	0.012711	0.029608
RETAIL TRADE	54	0.012319	0.005569	0.010870	0.004918	0.008107
FINANCE	55	0.032238	0.062882	0.053643	0.043029	0.094469
REAL ESTATE RENTAL	56	0.000363	0.000117	0.000505	0.000128	0.000188
EDUCATION & RELATED	57	1.000249	0.000058	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000004	1.000004	0.000003	0.000086	0.000102
ACCOM & FOOD SERV	59	0.018867	0.005556	1.005062	0.006538	0.008745
BUSINESS SERV IND	60	0.024650	0.029840	0.024722	1.033216	0.024759
PERSONAL SERV IND	61	0.019105	0.022937	0.015553	0.028065	1.061441
SUP		1.560575	1.401461	1.843673	1.276001	1.577721

TABLE C-6 FRESH WATER USE INTERACTION

PAGE

		WHEAT, UNMILLED 1	BARLEY, UNMILLED 2	OIL SEEDS 3	OTH CEREAL CROPS 4	HAY, FORAGE 5	LIVESTOCK 6
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.028622	0.031751	0.028731	0.021817	0.021133	23.577316
POULTRY & EGG PRDRS	7	0.000634	0.000734	0.000564	0.000546	0.000593	0.000977
DAIRY PRODUCERS	8	0.000011	0.000012	0.000009	0.000009	0.000010	0.000711
OTH AG PRDRS	9	0.000025	0.000028	0.000021	0.000021	0.000025	0.000021
FORESTRY PRDRS	10	0.000169	0.000228	0.000159	0.000151	0.000163	0.000129
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.000340	0.000325	0.000281	0.000255	0.000273	0.000483
CRUDE OIL & GAS IND	13	0.883578	1.002069	0.726484	0.615746	0.659240	0.453065
OTH MINING IND	14	0.333964	0.371141	0.262173	0.240189	0.278757	0.205756
MEAT PROC IND	15	0.003410	0.003934	0.002984	0.002814	0.003213	0.011729
DAIRY INDUSTRY	16	0.000850	0.000974	0.000736	0.000694	0.000805	0.001361
FEEDS MFR IND	17	0.001443	0.001675	0.001342	0.001213	0.001279	0.349019
FLOUR CER BAKERY IND	18	0.000246	0.000310	0.000226	0.000214	0.000237	0.000204
VEGETABLE OIL MILLS	19	0.000004	0.000004	0.000004	0.000004	0.000004	0.000003
SOFT DRINKS MFR IND	20	0.000882	0.000979	0.000789	0.000760	0.000828	0.000672
BEERS & ALC MFR IND	21	0.000979	0.001116	0.000841	0.000788	0.000932	0.000900
OTH FOOD MFR IND	22	0.001568	0.001920	0.001375	0.001351	0.001471	0.002695
RUBBER PROD IND	23	0.000492	0.000533	0.000284	0.000273	0.001282	0.000563
LEATHER PROD IND	24	0.003102	0.003499	0.002498	0.002607	0.003723	0.003382
TEXTILE PROD IND	25	0.003866	0.003912	0.003476	0.002685	0.017651	0.006767
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.000025	0.000028	0.000023	0.000019	0.000040	0.000024
WOOD PROD IND	28	0.002813	0.003013	0.002407	0.002345	0.002575	0.002008
FURNITURE IND	29	0.000014	0.000015	0.000011	0.000010	0.000013	0.000010
PULP & PAPER IND	30	0.018778	0.026268	0.017906	0.017264	0.018198	0.014553
PRINTING & PUBL IND	31	0.000527	0.000610	0.000449	0.000426	0.000488	0.000410
PRIMARY MET IND	32	0.417860	0.481673	0.304645	0.274078	0.359299	0.262429
METAL FAB IND	33	0.116681	0.124748	0.082183	0.076160	0.102496	0.072546
MACHINERY IND	34	0.010185	0.010283	0.005976	0.005757	0.006887	0.005310
TRANSP EQUIP IND	35	0.001843	0.002060	0.001450	0.001320	0.001677	0.001356
ELECTR APPL IND	36	0.005658	0.005922	0.003872	0.003595	0.004963	0.003444
CEMENT MFR IND	37	0.008780	0.009814	0.007390	0.006321	0.007266	0.006134
CONCRETE PROD IND	38	0.003159	0.003619	0.002626	0.002261	0.002637	0.002211
READY MIX MFR IND	39	0.003812	0.004127	0.003165	0.002729	0.003183	0.002666
OTH NON-METAL IND	40	0.003162	0.003623	0.002629	0.002263	0.002640	0.002213
PETROLEUM & COAL IND	41	0.810438	0.873218	0.631113	0.450167	0.553510	0.371947
FERTILIZER MFR IND	42	1.197065	1.486550	1.079374	1.150568	1.027007	0.680171
CHEMICAL & REL IND	43	3.040120	4.929761	3.149661	2.957747	3.084182	2.589162
MISC MFR IND	44	0.035563	0.040088	0.030254	0.027865	0.040779	0.028422
RPW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.000563	0.000598	0.000476	0.000399	0.000450	0.000394
TRANSP SERV IND	47	0.001781	0.002128	0.001551	0.001465	0.001652	0.001692
STORAGE SERV IND	48	0.007133	0.007424	0.006915	0.006662	0.006736	0.009745
COMMUNIC SERV IND	49	0.005193	0.004952	0.004275	0.003369	0.003230	0.002587
ELECTRICAL POWER	50	0.047988	0.045189	0.039707	0.036287	0.038582	0.030536
GAS DISTRIB IND	51	0.002103	0.002430	0.001773	0.001995	0.001670	0.002388
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.056995	0.059700	0.052242	0.049171	0.054956	0.047740
RETAIL TRADE	54	0.007314	0.007712	0.006513	0.005004	0.003548	0.003625
FINANCE	55	0.009040	0.008778	0.006828	0.006974	0.005995	0.008080
REAL ESTATE RENTAL	56	0.004971	0.004874	0.005171	0.005445	0.004403	0.002918
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000001	0.000001	0.000001	0.000001	0.000002	0.000002
ACCOM & FOOD SERV	59	0.005002	0.005738	0.004392	0.004246	0.004674	0.003782
BUSINESS SERV IND	60	0.004216	0.004575	0.003959	0.003513	0.004755	0.005392
PERSONAL SERV IND	61	0.003145	0.003433	0.002231	0.004067	0.005423	0.005720
SUM		7.095986	9.547279	6.457134	6.001313	6.346794	28.823532

TABLE C-6 FRESH WATER USE INTERACTION (CONTINUED)

		POULTRY	EGGS IN SHELL	MILK, CREAM UNP	OTH AG PROD	FOREST PROD	FISHING, H & T
		7	8	9	10	11	12
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.699454	0.699454	0.779708	0.018969	0.329859	0.016874
POULTRY & EGG PRDRS	7	5.770952	5.770952	0.001606	0.000395	0.004371	0.000230
DAIRY PRODUCERS	8	0.000160	0.000160	0.848064	0.000065	0.000049	0.000005
OTH AG PRDRS	9	0.000024	0.000024	0.000028	0.114594	0.000186	0.000012
FORESTRY PRDRS	10	0.000169	0.000169	0.000167	0.000072	0.045957	0.000079
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.000304	0.000304	0.000663	0.000367	0.000092	0.000036
CRUDE OIL & GAS IND	13	0.777036	0.777036	0.672349	0.271569	0.182887	0.211187
OTH MINING IND	14	0.319509	0.319509	0.269021	0.095738	0.227513	0.248362
MEAT PROC IND	15	0.153204	0.153204	0.021944	0.001528	0.070116	0.001583
DAIRY INDUSTRY	16	0.012336	0.012336	0.002312	0.000385	0.003791	0.000460
FEEDS MFR IND	17	5.731048	5.731048	0.706122	0.000820	0.056534	0.000630
FLOUR CER BAKERY IND	18	0.000390	0.000390	0.000283	0.000094	0.000739	0.000101
VEGETABLE OIL MILLS	19	0.000081	0.000081	0.000002	0.000000	0.000061	0.000000
SOFT DRINKS MFR IND	20	0.000931	0.000931	0.000854	0.000309	0.003240	0.000350
BEERS & ALC MFR IND	21	0.001427	0.001427	0.001123	0.000313	0.004468	0.000489
OTH FOOD MFR IND	22	0.027241	0.027241	0.004498	0.000444	0.003581	0.000457
RUBBER PROD IND	23	0.000403	0.000403	0.000593	0.000125	0.000826	0.000221
LEATHER PROD IND	24	0.003926	0.003926	0.004026	0.001296	0.012390	0.002011
TEXTILE PROD IND	25	0.003538	0.003538	0.007742	0.001920	0.002453	0.007199
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.000027	0.000027	0.000035	0.000012	0.000080	0.000022
WOOD PROD IND	28	0.001756	0.001756	0.002666	0.000105	0.002619	0.000613
FURNITURE IND	29	0.000014	0.000014	0.000016	0.000005	0.000040	0.000052
PULP & PAPER IND	30	0.020053	0.020053	0.018722	0.003285	0.016639	0.005977
PRINTING & PUBL IND	31	0.000607	0.000607	0.000565	0.000154	0.002023	0.000232
PRIMARY MET IND	32	0.276657	0.276657	0.361514	0.141486	0.438912	0.160950
METAL FAB IND	33	0.098234	0.098234	0.102154	0.041284	0.153318	0.057812
MACHINERY IND	34	0.003819	0.003819	0.006842	0.003417	0.004747	0.003525
TRANSP EQUIP IND	35	0.002285	0.002285	0.002373	0.000605	0.007976	0.012805
ELECTR APPL IND	36	0.003992	0.003992	0.004569	0.002102	0.009720	0.002343
CEMENT MFR IND	37	0.006085	0.006085	0.009036	0.003134	0.008694	0.001656
CONCRETE PROD IND	38	0.002544	0.002544	0.003249	0.001358	0.003425	0.000962
READY MIX MFR IND	39	0.003071	0.003071	0.003921	0.001630	0.004134	0.001040
OTH NON-METAL IND	40	0.002547	0.002547	0.003252	0.001351	0.003429	0.000863
PETROLEUM & COAL IND	41	0.405163	0.405163	0.767872	0.159081	0.240584	0.297697
FERTILIZER MFR IND	42	0.287848	0.287848	0.405342	0.033864	0.016605	0.002423
CHEMICAL & REL IND	43	2.921235	2.921235	3.750875	0.452868	1.630834	1.034995
MISC MFR IND	44	0.033371	0.033371	0.037004	0.056508	0.065204	0.150911
NFM CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.000328	0.000328	0.000593	0.000163	0.000518	0.000357
TRANSP SERV IND	47	0.006821	0.006821	0.008506	0.000533	0.006679	0.001996
STORAGE SERV IND	48	0.078148	0.078148	0.015352	0.001382	0.006427	0.001842
COMMUNIC SERV IND	49	0.002748	0.002748	0.003055	0.002299	0.003524	0.000669
ELECTRICAL POWER	50	0.043613	0.043613	0.096158	0.054163	0.012708	0.004527
GAS DISTRIB IND	51	0.002101	0.002101	0.002534	0.000722	0.000572	0.000486
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.054476	0.054476	0.067574	0.011701	0.039422	0.020719
RETAIL TRADE	54	0.004111	0.004111	0.009172	0.005796	0.006941	0.005459
FINANCE	55	0.005315	0.005315	0.008723	0.002043	0.007739	0.001570
REAL ESTATE RENTAL	56	0.001176	0.001176	0.001786	0.000003	0.000057	0.000003
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000001	0.000001	0.000002	0.000001	0.000003	0.000001
ACCOM & FOOD SERV	59	0.005223	0.005223	0.004771	0.004354	0.018000	0.001969
BUSINESS SERV IND	60	0.003775	0.003775	0.006485	0.001602	0.010826	0.001859
PERSONAL SERV IND	61	0.004000	0.004000	0.006180	0.001821	0.007198	0.000967
SDS		17.783081	17.783081	8.228722	1.503158	3.079035	2.258556

TABLE C-6 FRESH WATER USE INTERACTION (CONTINUED)

		COAL	CRUDE OIL	NATURAL GAS	SULPHUR	OTH NIN PROD	BEEF, PORK ETC.
		13	14	15	16	17	18
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.082973	0.023427	0.023427	0.023427	0.000651	17.405045
POULTRY & EGG PRDRS	7	0.002070	0.000603	0.000603	0.000603	0.002091	0.182520
DAIRY PRODUCERS	8	0.000042	0.000012	0.000012	0.000012	0.000042	0.000585
OTH AG PRDRS	9	0.000119	0.000034	0.000034	0.000034	0.000116	0.000037
FORESTRY PRDRS	10	0.000150	0.000070	0.000070	0.000070	0.000158	0.000224
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.189394	0.000170	0.000170	0.000170	0.000257	0.000410
CRUDE OIL & GAS IND	13	0.272232	13.497319	13.497319	13.497319	0.259620	0.384216
OTH MINING IND	14	0.476932	1.343492	1.343492	1.343492	32.590714	0.226211
MEAT PROC IND	15	0.013894	0.004006	0.004006	0.004006	0.014035	3.864361
DAIRY INDUSTRY	16	0.003816	0.001095	0.001095	0.001095	0.003857	0.006466
FEEDS MFR IND	17	0.004092	0.001223	0.001223	0.001223	0.004092	0.422051
FLOUR CER BAKERY IND	18	0.000771	0.000229	0.000229	0.000229	0.000778	0.000598
VEGETABLE OIL MILLS	19	0.000000	0.000001	0.000001	0.000001	0.000000	0.000002
SOFT DRINKS MFR IND	20	0.003409	0.000980	0.000980	0.000980	0.003446	0.001128
BEERS & ALC MFR IND	21	0.004707	0.001342	0.001342	0.001342	0.004758	0.001526
OTH FOOD MFR IND	22	0.003403	0.001008	0.001008	0.001008	0.003440	0.011407
RUBBER PROD IND	23	0.000858	0.000298	0.000298	0.000298	0.000877	0.000584
LEATHER PROD IND	24	0.012991	0.003989	0.003989	0.003989	0.013025	0.004962
TEXTILE PROD IND	25	0.001166	0.000377	0.000377	0.000377	0.000833	0.005515
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.000385	0.000024	0.000024	0.000024	0.000084	0.000034
WOOD PROD IND	28	0.001961	0.002482	0.002482	0.002482	0.001266	0.002524
FURNITURE IND	29	0.000047	0.000013	0.000013	0.000013	0.000040	0.000014
PULP & PAPER IND	30	0.017259	0.006224	0.006224	0.006224	0.019172	0.026339
PRINTING & PUBL IND	31	0.002123	0.000628	0.000628	0.000628	0.002152	0.000708
PETROPY REF IND	32	0.559282	0.306781	0.306781	0.306781	0.736890	0.282305
METAL FAB IND	33	0.128609	0.064114	0.064114	0.064114	0.127379	0.089912
MACHINERY IND	34	0.007957	0.002731	0.002731	0.002731	0.008535	0.004684
TRANSP EQUIP IND	35	0.009210	0.002004	0.002004	0.002004	0.006974	0.002302
ELECTR APPL IND	36	0.011221	0.003472	0.003472	0.003472	0.011468	0.004520
CEMENT MFR IND	37	0.005733	0.010038	0.010038	0.010038	0.004112	0.006146
CONCRETE PROD IND	38	0.002532	0.003454	0.003454	0.003454	0.002544	0.002401
READY MIX MFR IND	39	0.003056	0.004168	0.004168	0.004168	0.002966	0.002897
OTH NON-METAL IND	40	0.002534	0.003457	0.003457	0.003457	0.002546	0.002403
PETROLEUM & COAL IND	41	0.328286	0.082793	0.082793	0.082793	0.347510	0.311546
FERTILIZER MFR IND	42	0.007386	0.002448	0.002448	0.002448	0.007342	0.513120
CHEMICAL & REL IND	43	0.987305	0.561232	0.561232	0.561232	0.961306	2.016328
MISC MFR IND	44	0.116812	0.029753	0.029753	0.029753	0.078408	0.046313
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.000287	0.000699	0.000699	0.000699	0.000160	0.000361
TRANSP SERV IND	47	0.003752	0.001384	0.001384	0.001384	0.006129	0.003285
STORAGE SERV IND	48	0.006469	0.002411	0.002411	0.002411	0.006310	0.011609
COMMUNIC SERV IND	49	0.003328	0.002336	0.002336	0.002336	0.004134	0.003337
ELECTRICAL POWER	50	0.137413	0.024670	0.024670	0.024670	0.028185	0.059819
GAS DISTRIB IND	51	0.001056	0.000601	0.000601	0.000601	0.000740	0.002114
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.048554	0.016122	0.016122	0.016122	0.048382	0.065187
RETAIL TRADE	54	0.010446	0.002727	0.002727	0.002727	0.008741	0.004455
FINANCE	55	0.007343	0.021429	0.021429	0.021429	0.006072	0.006937
REAL ESTATE RENTAL	56	0.000018	0.000005	0.000005	0.000005	0.000018	0.002192
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000003	0.000003	0.000003	0.000003	0.000002	0.000002
ACCOM & FOOD SERV	59	0.018974	0.005382	0.005382	0.005382	0.019188	0.006312
BUSINESS SERV IND	60	0.009578	0.012127	0.012127	0.012127	0.007152	0.005185
PERSONAL SERV IND	61	0.005746	0.003595	0.003595	0.003595	0.006011	0.006549
SUM		3.517361	16.058899	16.058899	16.058899	35.442627	26.389353

TABLE C-6 FRESH WATER USE INTERACTION (CONTINUED)

		DAIRY, PROC 19	FEEDS MFR 20	VEG OIL PROD 21	FLOUR, CER & B 22	SOFT DRINKS 23	BEERS & ALC 24
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.417947	1.379486	0.292959	0.288585	0.171976	0.075990
POULTRY & EGG PRDRS	7	0.005482	0.017508	0.003804	0.028221	0.018980	0.003156
DAIRY PRODUCERS	8	0.022118	0.000314	0.000039	0.000280	0.000217	0.000052
OTH AG PRDRS	9	0.000035	0.000036	0.000036	0.000364	0.000115	0.000035
FORESTRY PRDRS	10	0.000651	0.000279	0.000173	0.000464	0.000498	0.000415
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.000503	0.000326	0.000286	0.000299	0.000166	0.000241
CRUDE OIL & GAS IND	13	0.458196	0.482456	0.401749	0.474063	0.256032	0.262907
OTH MINING IND	14	0.345685	0.466506	0.214169	0.259870	0.438771	0.335115
MEAT PROC IND	15	0.018430	0.302709	0.062062	0.060248	0.033684	0.013490
DAIRY INDUSTRY	16	2.309098	0.024183	0.002060	0.015143	0.005209	0.003678
FEEDS MFR IND	17	0.345443	11.370428	0.008833	0.067132	0.025246	0.005496
FLOUR CER BAKERY IND	18	0.000901	0.000677	0.000619	0.643816	0.001422	0.000795
VEGETABLE OIL MILLS	19	0.000001	0.000002	0.212402	0.000002	0.000001	0.000001
SOFT DRINKS MFR IND	20	0.001812	0.001548	0.002647	0.001757	9.809335	0.003222
BEERS & ALC MFR IND	21	0.002817	0.002427	0.000881	0.003013	0.007923	4.646483
OTH FOOD MFR IND	22	0.050478	0.053635	0.001894	0.094766	0.203509	0.017838
RUBBER PROD IND	23	0.000658	0.000644	0.000325	0.000638	0.000845	0.000787
LEATHER PROD IND	24	0.007688	0.006336	0.003534	0.007063	0.013462	0.011867
TEXTILE PROD IND	25	0.004562	0.006777	0.003891	0.011400	0.001727	0.001817
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.000052	0.000047	0.000025	0.000058	0.000087	0.000078
WOOD PROD IND	28	0.003358	0.002401	0.005867	0.002409	0.002389	0.004379
FURNITURE IND	29	0.000025	0.000022	0.000013	0.000022	0.000038	0.000033
PULP & PAPER IND	30	0.081212	0.033612	0.015549	0.057960	0.062360	0.045126
PRINTING & PUBL IND	31	0.001168	0.001014	0.000444	0.001130	0.002212	0.002006
PRIMARY MET IND	32	0.558497	0.412006	0.322387	0.334277	0.622267	0.454165
METAL FAB IND	33	0.260562	0.160454	0.111172	0.109719	0.303810	0.189131
MACHINERY IND	34	0.004413	0.005271	0.005767	0.005569	0.004213	0.005031
TRANSP EQUIP IND	35	0.004058	0.003776	0.001690	0.003967	0.006834	0.006159
ELECTR APPL IND	36	0.006584	0.006294	0.004509	0.006749	0.010413	0.009688
CEMENT MFR IND	37	0.009748	0.007069	0.005861	0.006949	0.034709	0.025739
CONCRETE PROD IND	38	0.004637	0.002840	0.002458	0.002942	0.022595	0.016313
READY MIX MFR IND	39	0.005596	0.003428	0.002966	0.003551	0.027269	0.019688
OTH NON-METAL IND	40	0.004642	0.002843	0.002460	0.002945	0.022617	0.016329
PETROLEUM & COAL IND	41	0.557631	0.440993	0.382993	0.452144	0.276273	0.240988
FERTILIZER MFR IND	42	0.207126	0.565981	0.465642	0.504638	0.101746	0.294509
CHEMICAL & REL IND	43	2.584511	4.326092	2.804924	2.822959	2.083393	2.136222
MISC MFR IND	44	0.082946	0.054395	0.208557	0.080045	0.122426	0.103587
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.000417	0.000401	0.000308	0.000365	0.000271	0.000287
TRANSP SERV IND	47	0.008312	0.012533	0.004430	0.009801	0.005110	0.004029
STORAGE SERV IND	48	0.010582	0.153700	0.039200	0.007968	0.107008	0.065855
COMMUNIC SERV IND	49	0.003466	0.004391	0.003006	0.004435	0.004351	0.004028
ELECTRICAL POWER	50	0.069562	0.086448	0.081015	0.042744	0.023465	0.034735
GAS DISTRIB IND	51	0.002193	0.001745	0.001938	0.001616	0.001375	0.001320
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.061238	0.095214	0.054822	0.070077	0.067801	0.055697
RETAIL TRADE	54	0.008390	0.006773	0.007331	0.007460	0.008810	0.007388
FINANCE	55	0.006525	0.006106	0.004458	0.006915	0.005567	0.004285
REAL ESTATE RENTAL	56	0.000903	0.002094	0.002581	0.001968	0.000416	0.000937
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000002	0.000002	0.000001	0.000002	0.000002	0.000002
ACCOM & FOOD SERV	59	0.010396	0.008734	0.007728	0.009854	0.019703	0.018000
BUSINESS SERV IND	60	0.005952	0.004187	0.004719	0.005579	0.007747	0.004961
PERSONAL SERV IND	61	0.007548	0.005455	0.003474	0.005565	0.006037	0.003822
SUM		8.594433	20.492432	5.730580	6.529984	14.952355	9.161862

TABLE C-6 FRESH WATER USE INTERACTION (CONTINUED)

		OTH FOODS, NES 25	TIRES & TUBES 26	OTH RUBBER PROD 27	LEATHER PROD 28	TEXTILE PROD 29	HOSIERY & KNITTED 30
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.143390	0.067000	0.067000	1.056081	0.054890	0.051591
POULTRY & EGG PRDRS	7	0.159395	0.001663	0.001663	0.010986	0.001585	0.001347
DAIRY PRODUCERS	8	0.001714	0.000031	0.000031	0.000064	0.000030	0.000026
OTH AG PRDRS	9	0.000040	0.000083	0.000083	0.000078	0.000079	0.000067
FORESTRY PRDRS	10	0.000484	0.000672	0.000672	0.000381	0.000497	0.000408
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.000263	0.000253	0.000253	0.000222	0.000135	0.000193
CRUDE OIL & GAS IND	13	0.387919	0.155337	0.155337	0.111209	0.125183	0.100133
OTH MINING IND	14	0.425733	0.281607	0.281607	0.220054	0.203387	0.143779
MEAT PROC IND	15	0.023292	0.012460	0.012460	0.232176	0.009865	0.008947
DAIRY INDUSTRY	16	0.014599	0.002728	0.002728	0.002875	0.002600	0.002309
FEEDS MFR IND	17	0.187419	0.003832	0.003832	0.027573	0.003387	0.002940
FLOUR CER BAKERY IND	18	0.006460	0.000834	0.000834	0.000618	0.000862	0.000601
VEGETABLE OIL MILLS	19	0.000002	0.000000	0.000000	0.000000	0.000000	0.000000
SOFT DRINKS MFR IND	20	0.002392	0.002347	0.002347	0.002260	0.002236	0.002018
BEERS & ALC MFR IND	21	0.017611	0.003320	0.003320	0.003160	0.003171	0.002826
OTH FOOD MFR IND	22	1.966181	0.003476	0.003476	0.006076	0.004354	0.002997
RUBBER PROD IND	23	0.000707	0.154170	0.154170	0.009931	0.000936	0.000998
LEATHER PROD IND	24	0.009895	0.086608	0.086608	25.357101	0.010275	0.030929
TEXTILE PROD IND	25	0.003387	0.030072	0.030072	0.019032	0.448318	0.194569
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.000061	0.000225	0.000225	0.001326	0.000654	0.012530
WOOD PROD IND	28	0.006722	0.003008	0.003008	0.003638	0.002169	0.001543
FURNITURE IND	29	0.000030	0.000029	0.000029	0.000026	0.000048	0.000031
PULP & PAPER IND	30	0.055396	0.084467	0.084467	0.045501	0.062503	0.051631
PRINTING & PUBL IND	31	0.001512	0.001594	0.001594	0.001522	0.001455	0.001454
PRIMARY MET IND	32	0.572206	0.397319	0.397319	0.399582	0.352682	0.249884
METAL FAB IND	33	0.268598	0.136876	0.136876	0.171936	0.110956	0.080748
MACHINERY IND	34	0.004850	0.002649	0.002649	0.002610	0.002499	0.002180
TRANSP EQUIP IND	35	0.004986	0.005108	0.005108	0.004466	0.004518	0.004023
ELECTR APPL IND	36	0.008343	0.007348	0.007348	0.007220	0.007651	0.006463
CEMENT MFR IND	37	0.009982	0.008293	0.008293	0.005257	0.006959	0.005006
CONCRETE PROD IND	38	0.005263	0.004532	0.004532	0.002604	0.003444	0.002424
READY MIX MFR IND	39	0.006352	0.005470	0.005470	0.003142	0.004157	0.002925
OTH NON-METAL IND	40	0.005268	0.004537	0.004537	0.002606	0.003448	0.002426
PETROLEUM & COAL IND	41	0.323012	0.144602	0.144602	0.108075	0.107746	0.093867
FERTILIZER MFR IND	42	0.374955	0.021828	0.021828	0.039103	0.020895	0.013215
CHEMICAL & REL IND	43	2.500640	14.676627	14.676627	4.270822	14.082036	7.161501
MISC MFR IND	44	0.200839	0.121566	0.121566	0.200428	0.329906	0.189292
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.000320	0.000240	0.000240	0.000206	0.000273	0.000257
TRANSP SERV IND	47	0.008145	0.005278	0.005278	0.004116	0.004973	0.004103
STORAGE SERV IND	48	0.010391	0.042914	0.042914	0.013952	0.007471	0.005721
COMMUNIC SERV IND	49	0.004056	0.004544	0.004544	0.004387	0.004740	0.004220
ELECTRICAL POWER	50	0.037691	0.032301	0.032301	0.023515	0.017350	0.021165
GAS DISTRIB IND	51	0.002245	0.001228	0.001228	0.000680	0.001320	0.001220
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.077447	0.062846	0.062846	0.069810	0.087316	0.059133
RETAIL TRADE	54	0.007269	0.005284	0.005284	0.005353	0.005119	0.005707
FINANCE	55	0.005905	0.005513	0.005513	0.005486	0.005856	0.005945
REAL ESTATE RENTAL	56	0.001575	0.000016	0.000016	0.000141	0.000015	0.000017
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000002	0.000002	0.000002	0.000003	0.000002	0.000002
ACCOM & FOOD SERV	59	0.013353	0.013339	0.013339	0.012650	0.012707	0.011359
BUSINESS SERV IND	60	0.005977	0.005136	0.005136	0.007899	0.004829	0.005184
PERSONAL SERV IND	61	0.006900	0.006923	0.006923	0.007048	0.006519	0.006121
SUM		7.881256	16.617996	16.617996	32.484802	16.133957	8.557893

TABLE C-6 FRESH WATER USE INTERACTION (CONTINUED)

PAGE

		CLOTHING 31	LUMBER & PLYWOOD 32	WOOD PROD NES 33	FURNIT & FIX 34	PULP & PAPER 35	PRINTING & PUB 36
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.081444	0.086335	0.086335	0.051660	0.102702	0.061203
POULTRY & EGG PRDRS	7	0.002087	0.001889	0.001889	0.001304	0.001982	0.001414
DAIRY PRODUCERS	8	0.000041	0.000033	0.000033	0.000025	0.000034	0.000027
OTH AG PRDRS	9	0.000042	0.000098	0.000098	0.000070	0.000095	0.000075
FORESTRY PRDRS	10	0.000625	0.004918	0.004918	0.000605	0.008254	0.001766
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.000305	0.000201	0.000201	0.000169	0.000177	0.000170
CRUDE OIL & GAS IND	13	0.115389	0.191596	0.191596	0.105830	0.363624	0.124747
OTH MINING IND	14	0.173814	0.493847	0.493847	0.610134	0.410407	0.212227
MEAT PROC IND	15	0.014226	0.016247	0.016247	0.009062	0.019878	0.010813
DAIRY INDUSTRY	16	0.003758	0.002839	0.002839	0.002262	0.002874	0.002440
FEEDS MFR IND	17	0.004573	0.008662	0.008662	0.003084	0.012388	0.004530
FLOUR CER BAKERY IND	18	0.000807	0.000594	0.000594	0.000529	0.000624	0.000517
VEGETABLE OIL MILLS	19	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
SOFT DRINKS MFR IND	20	0.003336	0.002508	0.002508	0.001997	0.002370	0.002136
BEERS & ALC MFR IND	21	0.004617	0.003475	0.003475	0.002776	0.003300	0.002958
OTH FOOD MFR IND	22	0.003709	0.003907	0.003907	0.002576	0.003720	0.002449
RUBBER PROD IND	23	0.000816	0.000667	0.000667	0.005176	0.000680	0.000545
LEATHER PROD IND	24	0.013361	0.010595	0.010595	0.022703	0.010000	0.008431
TEXTILE PROD IND	25	0.070879	0.002091	0.002091	0.071722	0.003455	0.004119
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.246754	0.000063	0.000063	0.000149	0.000062	0.000058
WOOD PROD IND	28	0.001682	0.515619	0.515619	0.035263	0.003770	0.001785
FURNITURE IND	29	0.000036	0.000037	0.000037	0.199793	0.000028	0.000023
PULP & PAPER IND	30	0.079875	0.024294	0.024294	0.036500	1.077246	0.229255
PRINTING & PUBL IND	31	0.002097	0.001586	0.001586	0.001262	0.001719	0.091569
PRIMARY MET IND	32	0.302649	1.018380	1.018380	1.335110	0.393640	0.349742
METAL FAB IND	33	0.105534	0.546400	0.546400	0.445311	0.143052	0.081067
MACHINERY IND	34	0.003492	0.003019	0.003019	0.002377	0.002892	0.002349
TRANSP EQUIP IND	35	0.006588	0.005204	0.005204	0.004029	0.005288	0.004275
ELECTR APPL IND	36	0.010083	0.008431	0.008431	0.007739	0.007721	0.006917
CEMENT MFR IND	37	0.005480	0.013610	0.013610	0.010021	0.020470	0.007402
CONCRETE PROD IND	38	0.002762	0.007983	0.007983	0.005857	0.012503	0.003917
READY MIX MFR IND	39	0.003334	0.009634	0.009634	0.007068	0.015089	0.004727
OTH NON-METAL IND	40	0.002765	0.007991	0.007991	0.005863	0.012515	0.003921
PETROLEUM & COAL IND	41	0.106434	0.232514	0.232514	0.106172	0.327177	0.117521
FERTILIZER MFR IND	42	0.028849	0.007714	0.007714	0.008453	0.011588	0.006796
CHEMICAL & REL IND	43	3.408546	1.562832	1.562832	3.833484	4.565054	2.136660
MISC MFR IND	44	0.187605	0.228223	0.228223	0.463906	0.209395	0.109175
MFR CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.000205	0.000284	0.000284	0.000213	0.000326	0.000240
TRANSP SERV IND	47	0.003952	0.005532	0.005532	0.004208	0.006666	0.004530
STORAGE SERV IND	48	0.006543	0.007664	0.007664	0.008556	0.005361	0.004538
COMMUNIC SERV IND	49	0.004796	0.004579	0.004579	0.004360	0.003603	0.009647
ELECTRICAL POWER	50	0.044570	0.027922	0.027922	0.022227	0.024567	0.024531
GAS DISTRIB IND	51	0.000885	0.000859	0.000859	0.000862	0.003438	0.001086
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.054046	0.086434	0.086434	0.099103	0.046680	0.036551
RETAIL TRADE	54	0.008731	0.006621	0.006621	0.005469	0.006661	0.006380
FINANCE	55	0.007198	0.005941	0.005941	0.005153	0.005655	0.005699
REAL ESTATE RENTAL	56	0.000107	0.000019	0.000019	0.000012	0.000021	0.000013
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000002	0.000002	0.000002	0.000002	0.000002	0.000002
ACCOM & FOOD SERV	59	0.018619	0.013965	0.013965	0.011170	0.013257	0.011912
BUSINESS SERV IND	60	0.005204	0.005115	0.005115	0.005077	0.005483	0.008942
PERSONAL SERV IND	61	0.008197	0.006721	0.006721	0.006296	0.006806	0.004535
SUP		5.161435	5.195675	5.195675	7.573157	7.886492	3.715270

TABLE C-6 FRESH WATER USE INTERACTION (CONTINUED)

		IRON & STEEL 37	OTH PRIM METAL 38	METAL FAB PROD 39	MACHINERY 40	VEHICLES & OTH TRANS 41	ELECT APPLIANCES 42
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.062801	0.062801	0.053746	0.052248	0.057024	0.052703
POULTRY & EGG PRDRS	7	0.001637	0.001637	0.001472	0.001494	0.001445	0.001380
DAIRY PRODUCERS	8	0.000033	0.000033	0.000029	0.000029	0.000029	0.000027
OTH AG PRDRS	9	0.000091	0.000091	0.000077	0.000076	0.000080	0.000075
FORESTRY PRDRS	10	0.000221	0.000221	0.000201	0.000183	0.000393	0.000420
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.000418	0.000418	0.000232	0.000157	0.000208	0.000210
CRUDE OIL & GAS IND	13	0.233377	0.233377	0.131405	0.119489	0.124484	0.113012
OTH MINING IND	14	9.624420	9.624420	3.449954	1.663860	1.443922	1.362306
MEAT PROC IND	15	0.010913	0.010913	0.009426	0.009198	0.009838	0.009330
DAIRY INDUSTRY	16	0.002966	0.002966	0.002562	0.002497	0.002610	0.002441
FEEDS MFR IND	17	0.003308	0.003308	0.002917	0.002906	0.003142	0.003020
FLOUR CER BAKERY IND	18	0.000644	0.000644	0.000587	0.000536	0.000564	0.000590
VEGETABLE OIL MILLS	19	0.000001	0.000001	0.000000	0.000000	0.000000	0.000000
SOFT DRINKS MFR IND	20	0.002641	0.002641	0.002278	0.002214	0.002295	0.002148
BEERS & ALC MFR IND	21	0.003650	0.003650	0.003154	0.003074	0.003180	0.002991
OTH FOOD MFR IND	22	0.002917	0.002917	0.002576	0.003957	0.002631	0.002567
RUBBER PROD IND	23	0.001058	0.001058	0.000994	0.000419	0.006414	0.007650
LEATHER PROD IND	24	0.010701	0.010701	0.009007	0.010494	0.012508	0.012563
TEXTILE PROD IND	25	0.001454	0.001454	0.001282	0.001977	0.008815	0.003397
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.000066	0.000066	0.000057	0.000058	0.000072	0.000062
WOOD PROD IND	28	0.003625	0.003625	0.004438	0.003197	0.022959	0.002969
FURNITURE IND	29	0.000351	0.000351	0.000138	0.000101	0.002794	0.000172
PULP & PAPER IND	30	0.024355	0.024355	0.020915	0.020049	0.023874	0.021381
PRINTING & PUBL IND	31	0.001675	0.001675	0.001443	0.001405	0.001460	0.001389
PRIMARY MET IND	32	23.105850	23.105850	8.162361	3.581986	3.259360	3.022577
METAL FAB IND	33	0.366985	0.366985	5.430605	1.146207	0.662653	0.955167
MACHINERY IND	34	0.005784	0.005784	0.004633	0.182440	0.006327	0.003175
TRANSP EQUIP IND	35	0.005648	0.005648	0.005148	0.010917	0.694438	0.004737
ELECTR APPL IND	36	0.009031	0.009031	0.012785	0.068127	0.051264	1.252833
CEMENT MFR IND	37	0.021272	0.021272	0.015280	0.009947	0.018764	0.012771
CONCRETE PROD IND	38	0.012306	0.012306	0.009177	0.005689	0.011771	0.007391
READY MIX MFR IND	39	0.014852	0.014852	0.011075	0.006865	0.014205	0.008919
OTH NON-METAL IND	40	0.012319	0.012319	0.009184	0.005694	0.011782	0.007398
PETROLEUM & COAL IND	41	0.237166	0.237166	0.134048	0.117926	0.124634	0.109438
FERTILIZER MFR IND	42	0.008997	0.008997	0.006866	0.006551	0.007427	0.010341
CHEMICAL & REL IND	43	2.231956	2.231956	1.725151	1.682573	2.478737	5.239541
MISC MFR IND	44	0.065482	0.065482	0.072822	0.077241	0.119041	0.115837
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.000478	0.000478	0.000275	0.000237	0.000287	0.000286
TRANSP SERV IND	47	0.007123	0.007123	0.004889	0.004568	0.005049	0.005745
STORAGE SERV IND	48	0.008617	0.008617	0.006875	0.007911	0.008584	0.008445
COMMUNIC SERV IND	49	0.004453	0.004453	0.004483	0.005014	0.004918	0.005857
ELECTRICAL POWER	50	0.058594	0.058594	0.032603	0.022190	0.027626	0.029521
GAS DISTRIB IND	51	0.002129	0.002129	0.001180	0.000910	0.001062	0.000985
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.098024	0.098024	0.074837	0.085003	0.082626	0.076777
RETAIL TRADE	54	0.006851	0.006851	0.005630	0.005376	0.006436	0.005318
FINANCE	55	0.006240	0.006240	0.004435	0.004401	0.004251	0.006985
REAL ESTATE RENTAL	56	0.000013	0.000013	0.000013	0.000013	0.000013	0.000012
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000003	0.000003	0.000002	0.000002	0.000002	0.000002
ACCOM & FOOD SERV	59	0.014694	0.014694	0.012681	0.012339	0.012807	0.012037
BUSINESS SERV IND	60	0.008604	0.008604	0.008109	0.006124	0.005398	0.006782
PERSONAL SERV IND	61	0.006845	0.006845	0.003910	0.006880	0.006556	0.007067
SUM		36.313400	36.313400	19.458374	8.936728	9.356690	12.548329

TABLE C-6 PRESS WATER USE INTERACTION (CONTINUED)

		CEMENT	OTH NON-MET	PETROLEUM	FERTILIZER	CHEMICAL	MISC MFR
		43	44	45	46	47	48
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.059646	0.061832	0.041478	0.040287	0.065630	0.058990
POULTRY & EGG PRDRS	7	0.001748	0.001610	0.001098	0.001633	0.001951	0.001505
DAIRY PRODUCERS	8	0.000033	0.000032	0.000022	0.000020	0.000036	0.000029
OTH AG PRDRS	9	0.000086	0.000089	0.000060	0.000037	0.000087	0.000078
FORESTRY PRDRS	10	0.000564	0.000382	0.000204	0.000567	0.001461	0.000568
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.000371	0.000246	0.000409	0.000400	0.000284	0.000178
CRUDE OIL & GAS IND	13	0.219887	0.216021	7.957567	3.129749	0.267729	0.122816
OTH MINING IND	14	1.087216	3.402308	0.990691	0.987742	0.276435	0.619791
MEAT PROC IND	15	0.010759	0.010825	0.007289	0.006655	0.011962	0.010777
DAIRY INDUSTRY	16	0.002825	0.002891	0.001970	0.001395	0.002965	0.002551
FEEDS MFR IND	17	0.003724	0.003421	0.002277	0.003120	0.005014	0.003411
FLOUR CER BAKERY IND	18	0.000624	0.000622	0.000460	0.000398	0.001752	0.000489
VEGETABLE OIL MILLS	19	0.000000	0.000000	0.000001	0.000001	0.000000	0.000000
SOFT DRINKS MFR IND	20	0.002488	0.002567	0.001747	0.001106	0.002310	0.002222
BEERS & ALC MFR IND	21	0.003465	0.003564	0.002413	0.001290	0.003516	0.003117
OTH FOOD MFR IND	22	0.005058	0.002965	0.001984	0.006576	0.006483	0.003070
RUBBER PROD IND	23	0.000635	0.000902	0.000515	0.000432	0.000672	0.000860
LEATHER PROD IND	24	0.010273	0.010589	0.007046	0.004139	0.009834	0.030661
TEXTILE PROD IND	25	0.001674	0.001147	0.000758	0.000771	0.001925	0.004982
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.000061	0.000064	0.000043	0.000026	0.000058	0.000061
WOOD PROD IND	28	0.002003	0.002266	0.003727	0.003632	0.003618	0.006153
FURNITURE IND	29	0.000039	0.000036	0.000033	0.000016	0.000027	0.000051
PULP & PAPER IND	30	0.071562	0.047301	0.022267	0.069902	0.187115	0.067059
PRINTING & PUBL IND	31	0.001594	0.001630	0.001105	0.001475	0.001628	0.001485
PRIMARY MET IND	32	0.311668	0.867131	0.591108	0.408945	0.353942	1.169131
METAL FAB IND	33	0.100347	0.201969	0.209509	0.131108	0.141679	0.342180
MACHINERY IND	34	0.002836	0.003361	0.003377	0.001933	0.002807	0.002683
TRANSP EQUIP IND	35	0.004964	0.005227	0.006044	0.002160	0.005119	0.004428
ELECTR APPL IND	36	0.009179	0.008061	0.005940	0.003677	0.007750	0.025429
CEMENT MFR IND	37	7.392900	0.761636	0.013857	0.009916	0.008238	0.017539
CONCRETE PROD IND	38	0.014340	0.524055	0.005016	0.003910	0.004128	0.011069
READY MIX MFR IND	39	0.016944	0.632449	0.006054	0.004718	0.004982	0.013358
OTH NON-METAL IND	40	0.014054	0.524572	0.005021	0.003913	0.004132	0.011080
PETROLEUM & COAL IND	41	0.130607	0.210951	11.327064	0.346472	0.178617	0.111955
FERTILIZER MFR IND	42	0.010301	0.007916	0.007233	11.613709	0.072191	0.015087
CHEMICAL & REL IND	43	3.219317	2.531616	3.451864	4.498095	57.632275	9.181853
MISC MFR IND	44	0.157686	0.087687	0.078223	0.065045	0.092148	6.049733
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.000274	0.000308	0.000915	0.000590	0.000313	0.000208
TRANSP SERV IND	47	0.005653	0.006854	0.002492	0.005522	0.007142	0.003888
STORAGE SERV IND	48	0.004743	0.006466	0.003959	0.004417	0.005871	0.005620
COMMUNIC SERV IND	49	0.003819	0.003980	0.003002	0.004774	0.004794	0.004393
ELECTRICAL POWER	50	0.053473	0.038612	0.031115	0.057733	0.032101	0.024518
GAS DISTRIB IND	51	0.004229	0.002037	0.014560	0.007323	0.003345	0.001146
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.038390	0.063731	0.031120	0.044405	0.055723	0.056373
RETAIL TRADE	54	0.005480	0.006551	0.004310	0.005502	0.006575	0.005145
FINANCE	55	0.004651	0.004542	0.016552	0.009015	0.006354	0.004679
REAL ESTATE RENTAL	56	0.000015	0.000014	0.000010	0.000012	0.000021	0.000014
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000002	0.000003	0.000003	0.000002	0.000002	0.000002
ACCOM & FOOD SERV	59	0.013869	0.014309	0.009684	0.012871	0.014005	0.012534
BUSINESS SERV IND	60	0.004329	0.007275	0.009505	0.008726	0.005096	0.004272
PERSONAL SERV IND	61	0.007695	0.006847	0.005044	0.004354	0.006909	0.006278
SUM		13.017499	10.299045	28.886597	21.520081	59.707718	18.023528

TABLE C-6 FRESH WATER USE INTERACTION (CONTINUED) PAGE

		NEW CONSTRUCT 49	REPAIR CONSTRUCT 50	TRANSP SERV 51	STORAGE SERV 52	COMMUNIC 53	ELECT POWER 54
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.053799	0.083627	0.034278	0.070054	0.038686	0.020864
POULTRY & EGG PRDRS	7	0.001670	0.001607	0.000591	0.001558	0.000621	0.000478
DAIRY PRODUCERS	8	0.000026	0.000032	0.000012	0.000032	0.000013	0.000010
OTH AG PRDRS	9	0.000069	0.000075	0.000033	0.000087	0.000035	0.000026
FORESTRY PRDRS	10	0.000491	0.000738	0.000070	0.000206	0.000083	0.000065
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.000241	0.000220	0.000211	0.000197	0.000078	0.014865
CRUDE OIL & GAS IND	13	0.206011	0.365671	0.275701	0.148662	0.052382	0.517765
OTH MINING IND	14	1.801273	2.787511	0.123648	0.237196	0.150734	0.234426
MEAT PROC IND	15	0.007006	0.009861	0.004004	0.010483	0.004193	0.003194
DAIRY INDUSTRY	16	0.001756	0.002549	0.001076	0.002850	0.001126	0.000850
FEEDS MFR IND	17	0.003363	0.004343	0.001360	0.003312	0.001485	0.001134
FLOUR GRP BAKERY IND	18	0.000386	0.000620	0.000225	0.000581	0.000233	0.000179
VEGETABLE OIL MILLS	19	0.000000	0.000024	0.000000	0.000001	0.000001	0.000001
SOFT DRINKS MFR IND	20	0.001556	0.002385	0.000960	0.002549	0.001008	0.000772
BEERS & ALC MFR IND	21	0.002157	0.002937	0.001322	0.003504	0.001382	0.001051
OTH FOOD MFR IND	22	0.001900	0.002824	0.000981	0.002553	0.001025	0.000790
RUBBER PROD IND	23	0.001451	0.002193	0.001655	0.000709	0.000476	0.000274
LEATHER PROD IND	24	0.008717	0.009726	0.004606	0.010348	0.004276	0.003123
TEXTILE PROD IND	25	0.003275	0.001669	0.000746	0.003142	0.000744	0.000343
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.000049	0.000064	0.000030	0.000067	0.000032	0.000024
WOOD PROD IND	28	0.026880	0.057484	0.001454	0.003711	0.002226	0.003009
FURNITURE IND	29	0.000331	0.000101	0.000039	0.000029	0.000010	0.000012
PULP & PAPER IND	30	0.024177	0.027010	0.007444	0.022514	0.008194	0.004909
PRINTING & PUBL IND	31	0.001004	0.001280	0.000956	0.001600	0.001304	0.000539
PRIMARY MET IND	32	3.041444	5.466779	0.196856	0.448504	0.298269	0.331632
METAL FAB IND	33	0.706560	0.814807	0.050226	0.105775	0.068281	0.059750
MACHINERY IND	34	0.005497	0.023586	0.001320	0.003541	0.001687	0.002159
TRANSP EQUIP IND	35	0.004567	0.005202	0.008985	0.005175	0.002246	0.001796
ELECTR APPL IND	36	0.052011	0.014794	0.007648	0.007883	0.027083	0.002819
CEMENT MFR IND	37	0.085138	0.244264	0.005088	0.014562	0.008919	0.012317
CONCRETE PROD IND	38	0.032288	0.080213	0.002027	0.005222	0.003147	0.004160
READY MIX MFR IND	39	0.038968	0.096804	0.002447	0.006302	0.003796	0.005021
OTH NON-METAL IND	40	0.032321	0.080292	0.002029	0.005227	0.003150	0.004164
PETROLEUM & COAL IND	41	0.260925	0.464675	0.377204	0.187123	0.064015	0.104918
FERTILIZER MFR IND	42	0.005695	0.008627	0.002768	0.005948	0.002828	0.002106
CHEMICAL & REL IND	43	1.688997	2.684271	0.580009	0.899294	0.485451	0.330446
MISC MFR IND	44	0.120037	0.281068	0.025931	0.088341	0.034322	0.030910
NEW CONSTR IND	45	0.071500	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.000191	0.017783	0.000299	0.000972	0.000606	0.000873
TRANSP SERV IND	47	0.005109	0.008777	0.100849	0.007363	0.005583	0.002130
STORAGE SERV IND	48	0.007259	0.013930	0.003537	3.306519	0.002634	0.002235
COMMUNIC SERV IND	49	0.002953	0.004448	0.002289	0.004813	0.245306	0.001927
ELECTRICAL POWER	50	0.018792	0.030122	0.030263	0.028593	0.011253	2.216629
GAS DISTRIB IND	51	0.000897	0.001603	0.000663	0.000647	0.000252	0.007424
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.083366	0.118762	0.032000	0.037548	0.015389	0.016315
RETAIL TRADE	54	0.012117	0.021589	0.008954	0.008135	0.010977	0.008013
FINANCE	55	0.004620	0.004822	0.002182	0.006354	0.004329	0.005538
REAL ESTATE RENTAL	56	0.000011	0.000017	0.000007	0.000015	0.000007	0.000005
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000003	0.000002	0.000001	0.000002	0.000002	0.000001
ACCOM & FOOD SERV	59	0.008678	0.010990	0.005321	0.014089	0.005545	0.004199
BUSINESS SERV IND	60	0.009496	0.005672	0.002762	0.004827	0.007267	0.002876
PERSONAL SERV IND	61	0.007353	0.005561	0.003188	0.008818	0.004207	0.002490
SUM		8.458316	13.873990	1.916245	5.737524	1.586896	4.078653

TABLE C-6 FRESH WATER USE INTERACTION (CONTINUED) PAGE

		GAS PIPE SERV 55	WATER & OTH 56	WHOLESALE 57	RETAIL 58	FINANCE & OTH 59	REAL ESTATE 60
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.018576	0.105971	0.052778	1.343896	0.026356	0.033530
POULTRY & EGG PRDRS	7	0.000479	0.001889	0.001324	0.001522	0.000665	0.001505
DAIRY PRODUCERS	8	0.000010	0.000039	0.000026	0.000065	0.000013	0.000020
OTH AG PRDRS	9	0.000027	0.000113	0.000084	0.000073	0.000037	0.000031
FORESTRY PRDRS	10	0.000050	0.000218	0.000180	0.000236	0.000090	0.000106
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.000071	0.000299	0.000123	0.000323	0.000058	0.000077
CRUDE OIL & GAS IND	13	0.031757	1.192567	0.130616	0.138995	0.047983	0.052459
OTH MINING IND	14	0.108349	0.504823	0.126920	0.140373	0.229438	0.251800
MEAT PROC IND	15	0.003186	0.012700	0.009064	0.013708	0.004402	0.005649
DAIRY INDUSTRY	16	0.000873	0.003429	0.002402	0.002441	0.001200	0.001414
FEEDS MFR IND	17	0.030965	0.004383	0.002711	0.022002	0.001380	0.002954
FLOUR CER BAKERY IND	18	0.000178	0.000714	0.000584	0.000490	0.000249	0.000417
VEGETABLE OIL MILLS	19	0.000001	0.000003	0.000000	0.000001	0.000002	0.000047
SOFT DRINKS MFR IND	20	0.000783	0.003070	0.002141	0.002144	0.001079	0.003270
BEERS & ALC MFR IND	21	0.001071	0.004206	0.002936	0.002951	0.001466	0.001543
OTH FOOD MFR IND	22	0.000782	0.003117	0.002221	0.002273	0.001093	0.001173
RUBBER PROD IND	23	0.000218	0.000874	0.000497	0.000695	0.000352	0.000376
LEATHER PROD IND	24	0.003148	0.015650	0.012034	0.008540	0.004495	0.002184
TEXTILE PROD IND	25	0.000291	0.001159	0.001757	0.003905	0.000450	0.001171
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.000019	0.000091	0.000058	0.000636	0.000027	0.000015
WOOD PROD IND	28	0.001941	0.007473	0.002907	0.002095	0.004381	0.007533
FURNITURE IND	29	0.000009	0.000038	0.000021	0.000021	0.000015	0.000012
PULP & PAPER IND	30	0.004161	0.019569	0.020062	0.028359	0.006483	0.004787
PRINTING & PUBL IND	31	0.000485	0.001911	0.001516	0.001458	0.000764	0.000266
PRIMARY MET IND	32	0.211585	0.802808	0.238725	0.253206	0.449617	0.485617
METAL FAB IND	33	0.042322	0.178315	0.088705	0.085274	0.080853	0.096349
MACHINERY IND	34	0.001393	0.005307	0.002228	0.002609	0.002551	0.003561
TRANSP EQUIP IND	35	0.001478	0.006196	0.004116	0.004131	0.002359	0.000970
ELECTR APPL IND	36	0.002493	0.009425	0.006518	0.006722	0.003752	0.002652
CEMENT MFR IND	37	0.007915	0.028326	0.003724	0.005609	0.018111	0.021192
CONCRETE PROD IND	38	0.002703	0.009770	0.001699	0.002331	0.006082	0.006425
READY MIX MFR IND	39	0.003262	0.011791	0.002050	0.002913	0.007340	0.007754
OTH NON-METAL IND	40	0.002706	0.009780	0.001709	0.002333	0.006088	0.006422
PETROLEUM & COAL IND	41	0.638107	1.671236	0.164675	0.128895	0.652595	0.683986
FERTILIZER MFR IND	42	0.001718	0.008406	0.005909	0.042060	0.002487	0.002821
CHEMICAL & REL IND	43	0.255093	1.558229	0.753054	0.896311	0.421466	0.520180
MISC MFR IND	44	0.021168	0.089881	0.055643	0.053563	0.036506	0.043638
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.000555	0.001968	0.000175	0.000309	0.001291	0.001369
TRANSP SERV IND	47	0.000728	0.003402	0.002935	0.003171	0.001242	0.001689
STORAGE SERV IND	48	0.001493	0.009456	0.070256	0.036771	0.002399	0.027026
COMMERC SERV IND	49	0.002125	0.004281	0.006870	0.008324	0.003669	0.002344
ELECTRICAL POWER	50	0.010396	0.039868	0.018733	0.047648	0.008379	0.011061
GAS DISTRIB IND	51	0.164745	0.002502	0.000414	0.001444	0.000457	0.000565
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.009283	0.073721	1.182824	0.019480	0.016832	0.018676
RETAIL TRADE	54	0.002137	0.026817	0.005991	0.733446	0.003349	0.004118
FINANCE	55	0.003424	0.006075	0.007543	0.010824	0.117751	0.007556
REAL ESTATE RENTAL	56	0.000004	0.000020	0.000016	0.000171	0.000006	0.065115
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000001	0.000012	0.000003	0.000002	0.000001	0.000002
ACCOM & FOOD SERV	59	0.004294	0.016873	0.011918	0.011922	0.005851	0.010163
BUSINESS SERV IND	60	0.002624	0.031413	0.006451	0.004590	0.003168	0.007432
PERSONAL SERV IND	61	0.002821	0.032814	0.007473	0.006600	0.004806	0.002967
SUP		0.973986	6.523473	3.025313	4.087373	1.591184	1.841992

TABLE C-6 FRESH WATER USE INTERACTION (CONTINUED)

		EDUCATION & RELATED 61	HEALTH SERV 62	ACCOM & FOOD 63	BUSINESS SERV 64	PERSONAL SERV 65
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.104880	0.033748	1.826251	0.037216	0.054267
POULTRY & EGG PRDRS	7	0.002847	0.000854	0.109539	0.000988	0.001365
DAIRY PRODUCERS	8	0.000057	0.000017	0.000667	0.000020	0.000027
OTH AG PRDRS	9	0.000172	0.000048	0.000873	0.000057	0.000176
FORESTRY PRDRS	10	0.000230	0.000180	0.000192	0.000076	0.000221
FISHING, F & T PRDRS	11	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.000139	0.000058	0.000158	0.000041	0.000196
CRUDE OIL & GAS IND	13	0.205852	0.058789	0.137990	0.034092	0.116607
OTH MINING IND	14	0.171766	0.097734	0.134675	0.061113	0.140122
MEAT PROC IND	15	0.019153	0.005727	0.400492	0.006644	0.009458
DAIRY INDUSTRY	16	0.005266	0.001556	0.059192	0.001825	0.002453
FEEDS MFR IND	17	0.005503	0.001733	0.145975	0.001940	0.003856
FLOUR CER BAKERY IND	18	0.001055	0.000343	0.015368	0.000367	0.000540
VEGETABLE OIL MILLS	19	0.000000	0.000000	0.000001	0.000000	0.000000
SOFT DRINKS MFR IND	20	0.004704	0.001382	0.038265	0.001631	0.002176
BEERS & ALC MFR IND	21	0.006497	0.001916	0.002142	0.002252	0.003015
OTH FOOD MFR IND	22	0.004616	0.001479	0.057835	0.001602	0.002354
RUBBER PROD IND	23	0.001032	0.000351	0.000367	0.000368	0.000765
LEATHER PROD IND	24	0.017299	0.006298	0.005181	0.006823	0.030539
TEXTILE PROD IND	25	0.001555	0.003736	0.005852	0.000633	0.005958
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.000113	0.000039	0.000186	0.000040	0.000063
WOOD PROD IND	28	0.001167	0.000903	0.001579	0.000686	0.006441
FURNITURE IND	29	0.000068	0.000014	0.000081	0.000015	0.000022
PULP & PAPER IND	30	0.028726	0.012007	0.029198	0.009134	0.021157
PRINTING & PUBL IND	31	0.005294	0.000897	0.000851	0.001110	0.001415
PRIMARY MET IND	32	0.317784	0.145571	0.198318	0.119946	0.260791
METAL FAB IND	33	0.118895	0.047459	0.063295	0.042759	0.099468
MACHINERY IND	34	0.004495	0.001451	0.002092	0.001607	0.002344
TRANSP EQUIP IND	35	0.008878	0.002625	0.002558	0.003036	0.004158
ELECTR APPL IND	36	0.014877	0.005166	0.004063	0.004772	0.006402
CEMENT MFR IND	37	0.003658	0.002805	0.006472	0.001828	0.004840
CONCRETE PROD IND	38	0.001963	0.001306	0.003104	0.000848	0.002130
READY MIX MFR IND	39	0.002369	0.001576	0.003746	0.001024	0.002571
OTH NON-METAL IND	40	0.001965	0.001307	0.003107	0.000849	0.002132
PETROLEUM & COAL IND	41	0.133906	0.069963	0.128723	0.041324	0.139477
FERTILIZER MFR IND	42	0.009628	0.004638	0.006390	0.003392	0.007697
CHEMICAL & REL IND	43	1.179426	1.793898	0.970987	0.425897	2.849798
MISC MFR IND	44	0.138071	0.156671	0.049668	0.032816	0.092488
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.000113	0.000127	0.000273	0.000063	0.000243
TRANSP SERV IND	47	0.005167	0.001467	0.002855	0.001215	0.002495
STORAGE SERV IND	48	0.006151	0.003371	0.072197	0.009776	0.004364
COMMUNIC SERV IND	49	0.004476	0.010927	0.003099	0.005024	0.003860
ELECTRICAL POWER	50	0.020072	0.008169	0.022911	0.005915	0.020347
GAS DISTRIB IND	51	0.001298	0.000320	0.000855	0.000154	0.000553
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.029022	0.031161	0.041160	0.014750	0.034358
RETAIL TRADE	54	0.008961	0.004051	0.007907	0.003577	0.005697
FINANCE	55	0.003562	0.006948	0.005961	0.004755	0.010439
REAL ESTATE RENTAL	56	0.000024	0.000008	0.000356	0.000008	0.000012
EDUCATION & RELATED	57	0.129032	0.000008	0.000060	0.000006	0.000000
HOSPITAL & HEALTH	58	0.000002	0.518302	0.000002	0.000044	0.000053
ACCOM & FOOD SERV	59	0.026208	0.007718	1.396132	0.009062	0.012147
BUSINESS SERV IND	60	0.005477	0.006630	0.005493	0.229580	0.005501
PERSONAL SERV IND	61	0.005349	0.006422	0.004355	0.007858	0.297204
SUM		2.768809	3.065784	6.053032	1.140590	4.303288

TABLE C-7 CONSUMPTIVE WATER USE INTERACTION

PAGE

		WHEAT, UNMILLED 1	BARLEY, UNMILLED 2	OIL SEEDS 3	OTH CEREAL CROPS 4	HAY, FORAGE 5	LIVESTOCK 6
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.028622	0.031751	0.028731	0.021817	0.021133	23.577316
POULTRY & EGG PRDRS	7	0.000634	0.000734	0.000564	0.000546	0.000563	0.000977
DAIRY PRODUCERS	8	0.000011	0.000012	0.000009	0.000009	0.000010	0.000711
OTH AG PRDRS	9	0.0	0.0	0.0	0.0	0.0	0.0
FORESTRY PRDRS	10	0.0	0.0	0.0	0.0	0.0	0.0
FISHING, F & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.000017	0.000014	0.000014	0.000013	0.000014	0.000024
CRUDE OIL & GAS IND	13	0.816495	0.925992	0.671329	0.568998	0.609190	0.418667
OTH MINING IND	14	0.0	0.0	0.0	0.0	0.0	0.0
MEAT PROC IND	15	0.000511	0.000589	0.000447	0.000422	0.000481	0.001757
DAIRY INDUSTRY	16	0.000210	0.000241	0.000182	0.000172	0.000199	0.000337
FEEDS MFR IND	17	0.000087	0.000101	0.000081	0.000073	0.000077	0.021081
FLOUR CER BAKERY IND	18	0.000025	0.000031	0.000023	0.000021	0.000024	0.000220
VEGETABLE OIL MILLS	19	0.000002	0.000002	0.000002	0.000002	0.000002	0.000001
SOFT DRINKS MFR IND	20	0.000140	0.000155	0.000125	0.000120	0.000131	0.000106
BEERS & ALC MFR IND	21	0.000153	0.000175	0.000132	0.000123	0.000146	0.000125
OTH FOOD MFR IND	22	0.000312	0.000384	0.000275	0.000270	0.000294	0.000539
RUBBER PROD IND	23	0.0	0.0	0.0	0.0	0.0	0.0
LEATHER PROD IND	24	0.0	0.0	0.0	0.0	0.0	0.0
TEXTILE PROD IND	25	0.003866	0.003912	0.003478	0.002685	0.017051	0.006767
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.0	0.0	0.0	0.0	0.0	0.0
WOOD PROD IND	28	0.001875	0.002088	0.001685	0.001363	0.001717	0.001339
FURNITURE IND	29	0.0	0.0	0.0	0.0	0.0	0.0
PULP & PAPER IND	30	0.007824	0.010945	0.007461	0.007193	0.007583	0.006054
PRINTING & PUBL IND	31	0.000175	0.000203	0.000150	0.000142	0.000163	0.000137
PETRORF RFT IND	32	0.242257	0.256063	0.176621	0.158898	0.208306	0.152145
METAL FAB IND	33	0.032373	0.036611	0.023879	0.021131	0.028435	0.020128
MACHINERY IND	34	0.002546	0.002571	0.001494	0.001439	0.002222	0.001327
TRANSP EQUIP IND	35	0.000410	0.000458	0.000322	0.000293	0.000373	0.000301
ELECTR APPL IND	36	0.0	0.0	0.0	0.0	0.0	0.0
CEMENT MFR IND	37	0.008255	0.008851	0.006948	0.005942	0.006769	0.005767
CONCRETE PROD IND	38	0.002137	0.002313	0.001776	0.001529	0.001764	0.001496
READY MIX MFR IND	39	0.000930	0.001006	0.000772	0.000665	0.000776	0.000651
OTH NON-METAL IND	40	0.001118	0.001208	0.000928	0.000795	0.000932	0.000781
PETROLEUM & COAL IND	41	0.211770	0.228175	0.164912	0.117630	0.144634	0.097191
FERTILIZER MFR IND	42	0.700367	0.869737	0.631510	0.673159	0.600672	0.397948
CHEMICAL & REL IND	43	0.878952	1.412307	0.902334	0.847353	0.883575	0.741472
MISC MFR IND	44	0.003359	0.003782	0.002654	0.002629	0.003847	0.002681
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.000084	0.000089	0.000071	0.000059	0.000067	0.000059
TRANSP SERV IND	47	0.0	0.0	0.0	0.0	0.0	0.0
STORAGE SERV IND	48	0.000247	0.000257	0.000240	0.000231	0.000234	0.000328
COMMUNIC SERV IND	49	0.0	0.0	0.0	0.0	0.0	0.0
ELECTRICAL POWER	50	0.047988	0.045189	0.039707	0.036287	0.038582	0.070530
GAS DISTRIB IND	51	0.0	0.0	0.0	0.0	0.0	0.0
WATER & SYS IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.003698	0.003874	0.003390	0.003191	0.003566	0.003398
RETAIL TRADE	54	0.000458	0.000492	0.000532	0.000313	0.000222	0.000227
FINANCE	55	0.000573	0.000556	0.000433	0.000442	0.000380	0.000512
REAL ESTATE RENTAL	56	0.001559	0.001559	0.001654	0.001742	0.001409	0.000932
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
ACCOM & FOOD SERV	59	0.000398	0.000456	0.000349	0.000338	0.000372	0.000391
BUSINESS SERV IND	60	0.0	0.0	0.0	0.0	0.0	0.0
PERSONAL SERV IND	61	0.0	0.0	0.0	0.0	0.0	0.0
SUM		2.992420	3.850787	2.674525	2.478036	2.586155	25.533585

TABLE C-7 CONSUMPTIVE WATER USE INTERACTION (CONTINUED)

		POULTRY 7	EGGS IN SHELL 8	MILK, CREAM UNP 9	OTH AG PROD 10	FOREST PROD 11	FISHING, H & T 12
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.699454	0.699454	0.779788	0.018969	0.329839	0.016874
POULTRY & EGG PRDRS	7	5.770952	5.770952	0.001606	0.000395	0.004371	0.000230
DAIRY PRODUCERS	8	0.000160	0.000160	0.946004	0.000305	0.000049	0.000005
OTH AG PRDRS	9	0.0	0.0	0.0	0.0	0.0	0.0
FORESTRY PRDRS	10	0.0	0.0	0.0	0.0	0.0	0.0
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.000015	0.000015	0.000033	0.000016	0.000005	0.000002
CRUDE OIL & GAS IND	13	0.718042	0.718042	0.621303	0.250943	0.169002	0.195153
OTH MINING IND	14	0.0	0.0	0.0	0.0	0.0	0.0
MEAT PROC IND	15	0.022950	0.022950	0.003287	0.000289	0.010503	0.000237
DAIRY INDUSTRY	16	0.003051	0.003051	0.000572	0.000095	0.000938	0.000099
FEEDS MFR IND	17	0.346171	0.346171	0.042652	0.000050	0.003415	0.000338
FLOUR GRP BAKERY IND	18	0.000039	0.000039	0.000028	0.000009	0.000074	0.000010
VEGETABLE OIL MILLS	19	0.000001	0.000001	0.000001	0.000000	0.000000	0.000000
SOFT DRINKS MFR IND	20	0.000147	0.000147	0.000135	0.000049	0.000513	0.000056
BEERS & ALC MFR IND	21	0.000223	0.000223	0.000176	0.000049	0.000699	0.000077
OTH FOOD MFR IND	22	0.005449	0.005449	0.000900	0.000089	0.000716	0.000091
PORSEP PROD IND	23	0.0	0.0	0.0	0.0	0.0	0.0
LEATHER PROD IND	24	0.0	0.0	0.0	0.0	0.0	0.0
TEXTILE PROD IND	25	0.003538	0.003538	0.007762	0.001920	0.002453	0.007199
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.0	0.0	0.0	0.0	0.0	0.0
WOOD PROD IND	28	0.001171	0.001171	0.001777	0.003403	0.001746	0.002409
FURNITURE IND	29	0.0	0.0	0.0	0.0	0.0	0.0
PULP & PAPER IND	30	0.008355	0.008355	0.007801	0.001369	0.006933	0.002490
PRINTING & PUBL IND	31	0.000202	0.000202	0.000188	0.000051	0.000673	0.000077
PRIMARY MET IND	32	0.160394	0.160394	0.209590	0.082028	0.254462	0.093312
METAL FAB IND	33	0.027255	0.027255	0.028343	0.011454	0.042538	0.016040
MACHINERY IND	34	0.000955	0.000955	0.001461	0.000854	0.001187	0.000131
TRANSP EQUIP IND	35	0.000508	0.000508	0.000527	0.000134	0.001772	0.002757
ELECTR APPL IND	36	0.0	0.0	0.0	0.0	0.0	0.0
CEMENT MFR IND	37	0.005721	0.005721	0.008496	0.002947	0.008174	0.001557
CONCRETE PROD IND	38	0.001721	0.001721	0.002198	0.000914	0.002317	0.000583
READY MIX MFR IND	39	0.000749	0.000749	0.000956	0.000397	0.001008	0.000254
OTH NON-METAL IND	40	0.000899	0.000899	0.001148	0.000477	0.001210	0.000304
PETROLEUM & COAL IND	41	0.105870	0.105870	0.200595	0.041569	0.062570	0.076744
FERTILIZER MFR IND	42	0.168411	0.168411	0.237154	0.019813	0.009715	0.001242
CHEMICAL & PET IND	43	0.836893	0.836893	1.074573	0.129740	0.295320	0.296512
MISC MFR IND	44	0.003148	0.003148	0.003491	0.005331	0.006151	0.014236
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.000049	0.000049	0.000088	0.000024	0.000077	0.000008
TRANSP SERV IND	47	0.0	0.0	0.0	0.0	0.0	0.0
STORAGE SERV IND	48	0.002710	0.002710	0.000532	0.000048	0.000223	0.000064
COMMUNIC SERV IND	49	0.0	0.0	0.0	0.0	0.0	0.0
ELECTRICAL POWER	50	0.043613	0.043613	0.096158	0.054163	0.012708	0.004627
GAS DISTRIB IND	51	0.0	0.0	0.0	0.0	0.0	0.0
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.003535	0.003535	0.004385	0.000759	0.002558	0.001345
RETAIL TRADE	54	0.000257	0.000257	0.000574	0.000363	0.000434	0.000341
FINANCE	55	0.000337	0.000337	0.000553	0.000129	0.000490	0.000399
REAL ESTATE RENTAL	56	0.000376	0.000376	0.000571	0.000061	0.000016	0.000001
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000308
HOSPITAL & HEALTH	58	0.000000	0.000000	0.000000	0.000000	0.000000	0.000330
ACCOM & FOOD SERV	59	0.000416	0.000416	0.000380	0.000346	0.001432	0.000157
BUSINESS SERV IND	60	0.0	0.0	0.0	0.0	0.0	0.0
PERSONAL SERV IND	61	0.0	0.0	0.0	0.0	0.0	0.0
SUM		8.943724	8.943724	3.385670	0.629194	1.236710	0.735358

TABLE C-9 CONSUMPTIVE WATER USE INTERACTION (CONTINUED)

PAGE

		COAL 13	CRUDE OIL 14	NATURAL GAS 15	SULPROD 16	OTH MIN PROD 17	BEEF, PORK ETC. 18
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.082973	0.023027	0.023027	0.033027	0.000651	17.405045
POULTRY & EGG PRDRS	7	0.002070	0.000603	0.000603	0.000603	0.002391	0.162520
DAIRY PRODUCERS	8	0.000042	0.000012	0.000012	0.000012	0.000042	0.000585
OTH AG PRDRS	9	0.0	0.0	0.0	0.0	0.0	0.0
FORESTRY PRDRS	10	0.0	0.0	0.0	0.0	0.0	0.0
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.009424	0.000000	0.000000	0.000009	0.000013	0.000320
CRUDE OIL & GAS IND	13	0.251564	12.472586	12.472586	12.472586	0.239910	8.355045
OTH MINING IND	14	0.0	0.0	0.0	0.0	0.0	0.0
MEAT PROC IND	15	0.002081	0.000600	0.000600	0.000600	0.002102	0.578876
DAIRY INDUSTRY	16	0.000944	0.000271	0.000271	0.000271	0.000954	0.001599
FRUIT & VEG PROC IND	17	0.000267	0.000074	0.000074	0.000074	0.000247	0.025493
FLOUR & GRP BAKERY IND	18	0.000077	0.000023	0.000023	0.000023	0.000078	0.000360
VEGETABLE OIL MILLS	19	0.000000	0.000000	0.000000	0.000000	0.000000	0.000031
SOFT DRINKS MFR IND	20	0.000540	0.000155	0.000155	0.000155	0.000546	0.000179
BEERS & ALC MFR IND	21	0.000737	0.000210	0.000210	0.000210	0.000745	0.000239
OTH FOOD MFR IND	22	0.000681	0.000392	0.000392	0.000392	0.000688	0.000282
RUBBER PROD IND	23	0.0	0.0	0.0	0.0	0.0	0.0
LEATHER PROD IND	24	0.0	0.0	0.0	0.0	0.0	0.0
TEXTILE PROD IND	25	0.001166	0.000377	0.000377	0.000377	0.000633	0.000515
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.0	0.0	0.0	0.0	0.0	0.0
WOOD PROD IND	28	0.001307	0.001655	0.001655	0.001655	0.000844	0.001683
FURNITURE IND	29	0.0	0.0	0.0	0.0	0.0	0.0
PULP & PAPER IND	30	0.007191	0.002594	0.002594	0.002594	0.007968	0.010975
PRINTING & PUBL IND	31	0.000707	0.000209	0.000209	0.000209	0.000716	0.000236
PRIMARY MFI IND	32	0.324248	0.177858	0.177858	0.177858	0.427217	0.167495
METAL FAB IND	33	0.035683	0.017789	0.017789	0.017789	0.035341	0.029946
MACHINERY IND	34	0.001989	0.000683	0.000683	0.000683	0.002136	0.001171
TRANSP EQUIP IND	35	0.002347	0.000845	0.000845	0.000845	0.001536	0.000511
ELECTR APPL IND	36	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHNG MFR IND	37	0.005390	0.009437	0.009437	0.009437	0.003866	0.005778
CONCRETE PROD IND	38	0.001713	0.002336	0.002336	0.002336	0.001382	0.001624
READY MIX MFR IND	39	0.000745	0.001017	0.001017	0.001017	0.000602	0.000707
OTH NON-METAL IND	40	0.030895	0.001220	0.001220	0.001220	0.000722	0.003648
PETROLEUM & COAL IND	41	0.085782	0.021634	0.021634	0.021634	0.096805	0.081408
FERTILIZER MFR IND	42	0.004322	0.001432	0.001432	0.001432	0.004296	0.003211
CHEMICAL & REL IND	43	0.282849	0.160785	0.160785	0.160785	0.273400	0.692344
MISC MFR IND	44	0.011019	0.002807	0.002807	0.002807	0.007367	0.004369
MTN CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.000043	0.000104	0.000104	0.000104	0.000024	0.000054
TRANSP SERV IND	47	0.0	0.0	0.0	0.0	0.0	0.0
STORAGE SERV IND	48	0.000224	0.000084	0.000084	0.000084	0.000219	0.000405
COMMUNIC SERV IND	49	0.0	0.0	0.0	0.0	0.0	0.0
ELECTRICAL POWER	50	0.137413	0.024670	0.024670	0.024670	0.028185	0.059819
GAS DISTRIB IND	51	0.0	0.0	0.0	0.0	0.0	0.0
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.003151	0.001046	0.001046	0.001046	0.003140	0.004230
RETAIL TRADE	54	0.000653	0.000171	0.000171	0.000171	0.000547	0.000279
FINANCE	55	0.000465	0.001358	0.001358	0.001358	0.000385	0.000439
REAL ESTATE RENTAL	56	0.000006	0.000002	0.000002	0.000002	0.000006	0.000701
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
ACCOM & FOOD SERV	59	0.001599	0.000428	0.000428	0.000428	0.001526	0.003502
BUSINESS SERV IND	60	0.0	0.0	0.0	0.0	0.0	0.0
PERSONAL SERV IND	61	0.0	0.0	0.0	0.0	0.0	0.0
SUP		1.261892	12.928298	12.928298	12.928298	1.223172	18.853789

TABLE C-7 CONSUMPTIVE WATER USE INTERACTIONS (CONTINUED)

PAGE

		DAIRY, PROC 19	FEEDS MFG 20	VEG OIL PROD 21	PLANT, CER & B 22	SOFT DRINKS 23	BEERS & ALC 24
WHEAT PRODUCERS	7	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	8	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.417947	1.379486	0.382999	0.288005	0.171976	0.075990
POULTRY & EGG PRDRS	7	0.005482	0.017800	0.003604	0.020221	0.018083	0.003155
DAIRY PRODUCERS	8	0.022118	0.000314	0.000039	0.000280	0.000217	0.000052
OTH AG PRDRS	9	0.0	0.0	0.0	0.0	0.0	0.0
FORESTRY PRDRS	10	0.0	0.0	0.0	0.0	0.0	0.0
FISHING, F & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.000025	0.000016	0.000014	0.000013	0.000008	0.000012
CRUDE OIL & GAS IND	13	0.451132	0.445027	0.371247	0.438072	0.230594	0.242946
OTH MINING IND	14	0.0	0.0	0.0	0.0	0.0	0.0
MEAT PROC IND	15	0.002761	0.045345	0.009297	0.009025	0.009044	0.002821
DAIRY INDUSTRY	16	0.571130	0.005971	0.000509	0.003745	0.001288	0.000919
FEEDS MFG IND	17	0.020846	0.486406	0.000534	0.004055	0.001525	0.000332
FLOUR CER BAKERY IND	18	0.000095	0.000068	0.000043	0.044339	0.000142	0.000079
VEGETABLE OIL MILLS	19	0.000351	0.000001	0.986252	0.000051	0.000080	0.000091
SOFT DRINKS MFR IND	20	0.000287	0.000205	0.000419	0.000279	1.552966	0.000510
BEERS & ALC MFR IND	21	0.000401	0.000380	0.000138	0.000472	0.001240	0.727269
OTH FOOD MFR IND	22	0.010097	0.010728	0.000379	0.018955	0.000706	0.003560
RUBBER PROD IND	23	0.0	0.0	0.0	0.0	0.0	0.0
LEATHER PROD IND	24	0.0	0.0	0.0	0.0	0.0	0.0
TEXTILE PROD IND	25	0.004562	0.004777	0.003891	0.011400	0.001727	0.001817
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.0	0.0	0.0	0.0	0.0	0.0
WOOD PROD IND	28	0.002239	0.001687	0.002911	0.001606	0.001583	0.002923
FURNITURE IND	29	0.0	0.0	0.0	0.0	0.0	0.0
PULP & PAPER IND	30	0.033879	0.014005	0.004479	0.024151	0.025984	0.020469
PRINTING & PUBL IND	31	0.000389	0.005338	0.000148	0.000378	0.000736	0.000668
PREPAPY MAT IND	32	0.323793	0.238863	0.100906	0.193780	0.380766	0.263305
METAL FAB IND	33	0.072293	0.044518	0.030805	0.039461	0.084292	0.052474
MACHINERY IND	34	0.001103	0.001318	0.001442	0.001392	0.001053	0.001258
TRANSP EQUIP IND	35	0.000901	0.000829	0.000376	0.000882	0.001519	0.001369
ELECTP APPL IND	36	0.0	0.0	0.0	0.0	0.0	0.0
CEMENT MFR IND	37	0.009164	0.006846	0.000511	0.006533	0.032632	0.026195
CONCRETE PROD IND	38	0.003137	0.001921	0.001463	0.001990	0.015285	0.011035
METAL FIN MFR IND	39	0.001365	0.000836	0.000723	0.000660	0.000650	0.000601
OTH NON-METAL IND	40	0.001639	0.001084	0.000840	0.001639	0.007963	0.005764
PETROLEUM & COAL IND	41	0.145791	0.115233	0.100051	0.119147	0.072191	0.062971
FERTILIZER MFR IND	42	0.121183	0.331139	0.272434	0.295365	0.059528	0.172308
CHEMICAL & REL IND	43	0.740426	0.239365	0.803571	0.888736	0.596863	0.611898
MISC MFR IND	44	0.007825	0.005131	0.019674	0.007551	0.011549	0.009772
NON CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.000062	0.000040	0.000041	0.000054	0.000046	0.000043
TRANSP SERV IND	47	0.0	0.0	0.0	0.0	0.0	0.0
STORAGE SERV IND	48	0.008367	0.005330	0.001360	0.002270	0.003711	0.002204
COMMUNIC SERV IND	49	0.0	0.0	0.0	0.0	0.0	0.0
ELECTRICAL POWER	50	0.049562	0.046448	0.041913	0.042744	0.023465	0.034735
GAS DISTRIB IND	51	0.0	0.0	0.0	0.0	0.0	0.0
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.003974	0.008179	0.003557	0.004147	0.004460	0.003614
RETAIL TRADE	54	0.000535	0.000424	0.000458	0.000447	0.000551	0.000462
FINANCE	55	0.000413	0.000387	0.000282	0.000432	0.000349	0.000271
REAL ESTATE RENTAL	56	0.000269	0.000470	0.000826	0.000535	0.000133	0.000319
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
ACCOM & FOOD SERV	59	0.000883	0.000695	0.000698	0.000784	0.001567	0.001432
BUSINESS SERV IND	60	0.0	0.0	0.0	0.0	0.0	0.0
PERSONAL SERV IND	61	0.0	0.0	0.0	0.0	0.0	0.0
SUM		3.047923	4.662406	2.272329	3.418642	3.346230	2.347919

TABLE C-7 CONSUMPTIVE RATES BSE INTERACTION (CONTINUED)

PAGE

		OTH FOODS, NEC 25	TIRES & TUBES 26	OTH RUBBER PROD 27	LEATHER PROD 28	TEXTILE PROD 29	KNITTED 30
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
POTAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.103390	0.067000	0.067000	1.056001	0.054890	0.051591
POULTRY & EGG PRDRS	7	0.159395	0.001663	0.001663	0.010986	0.001585	0.001347
DAIRY PRODUCERS	8	0.001716	0.000031	0.000031	0.000004	0.000030	0.000026
OTH AG PRDRS	9	0.0	0.0	0.0	0.0	0.0	0.0
FORESTRY PRDRS	10	0.0	0.0	0.0	0.0	0.0	0.0
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.000013	0.000013	0.000013	0.000011	0.000307	0.000010
CRUDE OIL & GAS IND	13	0.358468	0.143544	0.143544	0.102766	0.115679	0.092531
OTH MINING IND	14	0.0	0.0	0.0	0.0	0.0	0.0
MEAT PROC IND	15	0.003489	0.001866	0.001866	0.034780	0.001478	0.001340
DAIRY INDUSTRY	16	0.003636	0.000675	0.000675	0.000711	0.000643	0.000571
FEEDS MFG IND	17	0.011321	0.000231	0.000231	0.001655	0.000205	0.000178
FLOUR CER BAKERY IND	18	0.000646	0.000083	0.000083	0.000062	0.000080	0.000060
VEGETABLE OIL MILLS	19	0.000001	0.000000	0.000000	0.000000	0.000000	0.000000
SOFT DRINKS MFG IND	20	0.000379	0.000372	0.000372	0.000358	0.000356	0.000320
BEERS & ALC MFG IND	21	0.002756	0.000520	0.000520	0.000495	0.000496	0.000442
OTH FOOD MFG IND	22	0.393279	0.000695	0.000695	0.001215	0.000871	0.000500
RUBBER PROD IND	23	0.0	0.0	0.0	0.0	0.0	0.0
LEATHER PROD IND	24	0.0	0.0	0.0	0.0	0.0	0.0
TEXTILE PROD IND	25	0.003387	0.000072	0.000072	0.019032	0.440318	2.194569
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.0	0.0	0.0	0.0	0.0	0.0
WOOD PROD IND	28	0.004481	0.002005	0.002005	0.002625	0.001046	0.001029
FURNITURE IND	29	0.0	0.0	0.0	0.0	0.0	0.0
PULP & PAPER IND	30	0.023562	0.035195	0.035195	0.018859	0.426043	0.021513
PRINTING & PUBL IND	31	0.000503	0.000531	0.000531	0.000507	0.000485	0.000446
PRIMARY MET IND	32	0.331740	0.230348	0.230348	0.231718	0.204704	0.144872
METAL FAB IND	33	0.076523	0.037976	0.037976	0.047704	0.030796	0.022403
MACHINERY IND	34	0.001212	0.000662	0.000662	0.000653	0.000625	0.000545
TRANSP EQUIP IND	35	0.001160	0.001135	0.001135	0.000992	0.001004	0.000894
ELECTR APPL IND	36	0.0	0.0	0.0	0.0	0.0	0.0
CEMENT MFG IND	37	0.009384	0.007797	0.007797	0.004943	0.006542	0.004726
CONCRETE PROD IND	38	0.003560	0.003066	0.003066	0.001761	0.002330	0.001640
READY MIX MFG IND	39	0.001549	0.001334	0.001334	0.000766	0.001014	0.000713
OTH NON-METAL IND	40	0.001850	0.001601	0.001601	0.000920	0.001217	0.000856
PETROLEUM & COAL IND	41	0.084404	0.037785	0.037785	0.028240	0.028156	0.024328
FERTILIZER MFG IND	42	0.219375	0.012771	0.012771	0.022878	0.012225	0.007732
CHEMICAL & REL IND	43	0.716398	0.204647	0.204647	1.223530	0.034305	2.351784
MISC MFG IND	44	0.010946	0.011468	0.011468	0.010807	0.031122	0.017857
MFG CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.000048	0.000036	0.000036	0.000031	0.000041	0.000031
TRANSP SERV IND	47	0.0	0.0	0.0	0.0	0.0	0.0
STORAGE SERV IND	48	0.000360	0.001008	0.001008	0.000484	0.000259	0.000198
COMMUNIC SERV IND	49	0.0	0.0	0.0	0.0	0.0	0.0
ELECTRICAL POWER	50	0.037691	0.032301	0.032301	0.023515	0.017350	0.021165
GAS DISTRIB IND	51	0.0	0.0	0.0	0.0	0.0	0.0
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.005026	0.004078	0.004078	0.004530	0.005666	0.003837
RETAIL TRADE	54	0.000455	0.000331	0.000331	0.000335	0.000320	0.000357
FINANCE	55	0.000376	0.000349	0.000349	0.000348	0.000374	0.000377
REAL ESTATE RENTAL	56	0.000504	0.000005	0.000005	0.000045	0.000005	0.000005
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
ACCOM & FOOD SERV	59	0.001862	0.001061	0.001061	0.001066	0.001011	0.000904
BUSINESS SERV IND	60	0.0	0.0	0.0	0.0	0.0	0.0
PERSONAL SERV IND	61	0.0	0.0	0.0	0.0	0.0	0.0
SUM		3.498589	4.874731	4.874731	3.863498	3.631033	3.412008

TABLE C-7 CONSUMPTIVE WATER USE INTERACTION (CONTINUED)

		CLOTHING 31	LUMBER & PLYWOOD 32	WOOD PROD NEC 33	FURNIT & FIX 34	PULP & PAPER 35	PRINTING & PUB 36
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRODS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRODS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRODS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRODS	6	0.881844	0.886335	0.886335	0.051646	0.102702	0.5
POULTRY & EGG PRODS	7	0.002307	0.001889	0.001889	0.001304	0.001982	0.001203
DAIRY PRODUCERS	8	0.000041	0.000033	0.000033	0.000025	0.000034	0.001414
OTH AG PRODS	9	0.0	0.0	0.0	0.0	0.0	0.000027
FORESTRY PRODS	10	0.0	0.0	0.0	0.0	0.0	0.0
FISHING, H & T PRODS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.000015	0.000010	0.000010	0.000009	0.000003	0.0
CRUDE OIL & GAS IND	13	0.106628	0.177050	0.177050	0.097795	0.336017	0.000008
OTH MINING IND	14	0.0	0.0	0.0	0.0	0.0	0.115276
MEAT PROC IND	15	0.002131	0.002434	0.002434	0.001357	0.002978	0.0
DAIRY INDUSTRY	16	0.000930	0.000702	0.000702	0.000560	0.000711	0.001620
FEEDS MFR IND	17	0.000276	0.000523	0.000523	0.000186	0.000760	0.000604
FLOUR GRN BAKERY IND	18	0.000881	0.000859	0.000859	0.000553	0.000862	0.000274
VEGETABLE OIL MILLS	19	0.000000	0.000000	0.000000	0.000053	0.000062	0.000052
SOFT DRINKS MFR IND	20	0.000528	0.000397	0.000397	0.000316	0.000469	0.000333
BEERS & ALC MFR IND	21	0.000723	0.000544	0.000544	0.000434	0.000644	0.000330
OTH FOOD MFR IND	22	0.000742	0.000781	0.000781	0.000515	0.000744	0.002463
TOBACCO PROD IND	23	0.0	0.0	0.0	0.0	0.0	0.000490
LEATHER PROD IND	24	0.0	0.0	0.0	0.0	0.0	0.0
TEXTILE PROD IND	25	0.078879	0.002091	0.002091	0.071722	0.003455	0.0
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.004119
CLOTHING IND	27	0.0	0.0	0.0	0.0	0.0	0.0
WOOD PROD IND	28	0.001121	0.343746	0.343746	0.023509	0.002513	0.0
FURNITURE IND	29	0.0	0.0	0.0	0.0	0.0	0.001190
PULP & PAPER IND	30	0.033282	0.010123	0.010123	0.015209	0.448862	0.0
PRINTING & PUBL IND	31	0.000698	0.000528	0.000528	0.000427	0.000573	0.095525
PETROL REF IND	32	0.173683	0.590413	0.590413	0.374040	0.228332	0.030488
METAL PRD IND	33	0.029280	0.151599	0.151599	0.123552	0.039698	0.202766
MACHINERY IND	34	0.000873	0.000755	0.000755	0.000594	0.000723	0.0022476
TRANSP EQUIP IND	35	0.051464	0.031156	0.031156	0.030895	0.011775	0.000587
ELECTR APPL IND	36	0.0	0.0	0.0	0.0	0.0	0.000930
CRFINT PRT IND	37	0.005152	0.012705	0.012705	0.009422	0.019245	0.0
CONCRETE PROD IND	38	0.001869	0.005400	0.005400	0.003962	0.008658	0.004959
FIABR MIN NFM IND	39	0.000813	0.002350	0.002350	0.001724	0.003680	0.002650
OTH NON-METAL IND	40	0.000976	0.002820	0.002820	0.002069	0.004498	0.001153
PETROLEUM & COAL IND	41	0.027911	0.080757	0.080757	0.027743	0.083492	0.001381
PETROLEUM REF IND	42	0.016879	0.004913	0.004913	0.004946	0.006780	0.030709
CHEMICAL & REL IND	43	0.976501	0.447729	0.447729	1.098239	1.307823	0.003976
MISC MFR IND	44	0.017697	0.021529	0.021529	0.343762	0.199753	0.612125
AIR CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.016299
POTATO CONSTR IND	46	0.000530	0.000842	0.000842	0.000032	0.000049	0.0
TRANSP SERV IND	47	0.0	0.0	0.0	0.0	0.0	0.000036
STORAGE SERV IND	48	0.000227	0.000266	0.000266	0.000311	0.000188	0.0
COMMUNIC SERV IND	49	0.0	0.0	0.0	0.0	0.0	0.000157
ELECTRICAL POWER	50	0.044578	0.027922	0.027922	0.022227	0.026367	0.0
GAS DISTRIB IND	51	0.0	0.0	0.0	0.0	0.0	0.024521
WATER & OTR IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.003507	0.005609	0.005609	0.006431	0.003029	0.0
RETAIL TRADE	54	0.000546	0.000414	0.000414	0.000342	0.000417	0.002372
FINANCE	55	0.000458	0.000376	0.000376	0.000326	0.000358	0.000389
REAL ESTATE RENTAL	56	0.000034	0.000006	0.000006	0.000004	0.000007	0.000341
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000306
HOSPITAL & HEALTH	58	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
ACCOM & FOOD SERV	59	0.001681	0.001111	0.001111	0.000689	0.001035	0.000300
BUSINESS SERV IND	60	0.0	0.0	0.0	0.0	0.0	0.000968
PERSONAL SERV IND	61	0.0	0.0	0.0	0.0	0.0	0.0
SUM		1.607230	1.984800	1.984800	2.386580	2.657589	1.237027

TABLE C-7 CONSUMPTIVE WATER USE INTERACTION (CONTINUED)

		IRON & STEEL 37	OTH PRIM METAL 38	METAL FAB PROD 39	MACHINERY 40	VEHICLES & OTH TRANS 41	ELECT APPLIANCES 42
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDPS	6	0.062801	0.062801	0.053746	0.052248	0.057024	0.052703
POULTRY & EGG PRDRS	7	0.001637	0.001637	0.001472	0.001494	0.001445	0.001380
DAIRY PRODUCERS	8	0.000033	0.000033	0.000029	0.000029	0.000029	0.000027
OTH AG PRDRS	9	0.0	0.0	0.0	0.0	0.0	0.0
FORESTRY PRDRS	10	0.0	0.0	0.0	0.0	0.0	0.0
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.000021	0.000021	0.000012	0.000008	0.000010	0.000010
CRUDE OIL & GAS IND	13	0.215659	0.215659	0.121428	0.102101	0.115033	0.104432
OTH MINING IND	14	0.0	0.0	0.0	0.0	0.0	0.0
MEAT PROC IND	15	0.001635	0.001635	0.001412	0.001378	0.001474	0.001398
DAIRY INDUSTRY	16	0.000734	0.000734	0.000634	0.000618	0.000646	0.000604
FEEDS MFR IND	17	0.000200	0.000200	0.000176	0.000176	0.000190	0.000182
FLOUR CER BAKERY IND	18	0.000064	0.000064	0.000055	0.000053	0.000056	0.000059
VEGETABLE OIL MILLS	19	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
SOFT DRINKS MFR IND	20	0.000418	0.000418	0.000361	0.000251	0.000364	0.000340
BEERS & ALC MFR IND	21	0.000571	0.000571	0.000494	0.000481	0.000498	0.000468
OTH FOOD MFR IND	22	0.000583	0.000583	0.000655	0.000791	0.000526	0.000533
RUBBER PROD IND	23	0.0	0.0	0.0	0.0	0.0	0.0
LEATHER PROD IND	24	0.0	0.0	0.0	0.0	0.0	0.0
TEXTILE PROD IND	25	0.001454	0.001454	0.001282	0.001977	0.000815	0.000397
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.0	0.0	0.0	0.0	0.0	0.0
WOOD PROD IND	28	0.002417	0.002417	0.002959	0.002131	0.015306	0.001980
FURNITURE IND	29	0.0	0.0	0.0	0.0	0.0	0.0
PULP & PAPER IND	30	0.010148	0.010148	0.008715	0.008354	0.009948	0.021409
PRINTING & PUBL IND	31	0.000558	0.000558	0.000481	0.000468	0.000486	0.000462
PRIMARY MET IND	32	13.395784	13.395784	4.732165	2.076681	1.889637	1.752360
METAL FAB IND	33	0.101820	0.101820	1.506723	0.318016	0.183853	0.265011
MACHINERY IND	34	0.001446	0.001446	0.001158	0.045610	0.001582	0.000794
TRANSP EQUIP IND	35	0.001255	0.001255	0.001144	0.002426	0.154320	0.001053
ELECTR APPL IND	36	0.0	0.0	0.0	0.0	0.0	0.0
CEMENT MFR IND	37	0.019999	0.019999	0.014366	0.009352	0.017641	0.012007
CONCRETE PROD IND	38	0.008325	0.008325	0.006208	0.003848	0.007962	0.004999
READY MIX MFR IND	39	0.003622	0.003622	0.002701	0.001674	0.003464	0.002175
OTH NON-METAL IND	40	0.004348	0.004348	0.003242	0.002010	0.004159	0.002611
PETROLEUM & COAL IND	41	0.061972	0.061972	0.035027	0.030815	0.032567	0.026596
FERTILIZER MFR IND	42	0.005264	0.005264	0.004017	0.003833	0.004345	0.006050
CHEMICAL & REL IND	43	0.639424	0.639424	0.494232	0.482034	0.710123	1.501055
MISC MFR IND	44	0.006177	0.006177	0.006870	0.007286	0.011230	0.010880
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.000071	0.000071	0.000041	0.000035	0.000035	0.000043
TRANSP SERV IND	47	0.0	0.0	0.0	0.0	0.0	0.0
STORAGE SERV IND	48	0.000299	0.000299	0.000238	0.000274	0.000296	0.000293
COMMUNIC SERV IND	49	0.0	0.0	0.0	0.0	0.0	0.0
ELECTRICAL POWER	50	0.058594	0.058594	0.032603	0.022190	0.027626	0.029521
GAS DISTRIB IND	51	0.0	0.0	0.0	0.0	0.0	0.0
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.006361	0.006361	0.004856	0.005516	0.005362	0.004982
RETAIL TRADE	54	0.000429	0.000429	0.000352	0.000338	0.000403	0.000333
FINANCE	55	0.000395	0.000395	0.000281	0.000279	0.000265	0.000442
REAL ESTATE RENTAL	56	0.000005	0.000005	0.000004	0.000004	0.000004	0.000004
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
ACCOM & FOOD SERV	59	0.001169	0.001169	0.001009	0.000562	0.001019	0.000957
BUSINESS SERV IND	60	0.0	0.0	0.0	0.0	0.0	0.0
PERSONAL SERV IND	61	0.0	0.0	0.0	0.0	0.0	0.0
SUM		14.615683	14.615683	7.041158	3.185848	3.267742	3.813543

TABLE C-7 CONSUMPTIVE WATER USE INTERACTION (CONTINUED)

		CEMENT	OTH NON-MET	PETROLEUM	FERTILIZER	CHEMICAL	MISC MFR
		43	44	45	46	47	48
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.059646	0.061832	0.041478	0.040287	0.065636	0.058990
POULTRY & EGG PRDRS	7	0.001748	0.001610	0.001098	0.001633	0.001951	0.001565
DAIRY PRODUCERS	8	0.000033	0.000032	0.000022	0.000020	0.000036	0.000029
OTH AG PRDRS	9	0.0	0.0	0.0	0.0	0.0	0.0
FORESTRY PRDRS	10	0.0	0.0	0.0	0.0	0.0	0.0
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.000018	0.000012	0.000020	0.000020	0.000014	0.000009
CRUDE OIL & GAS IND	13	0.203193	0.199621	7.353418	2.892135	0.247403	0.113492
OTH MINING IND	14	0.0	0.0	0.0	0.0	0.0	0.0
MEAT PROC IND	15	0.001612	0.001622	0.001092	0.000997	0.001792	0.001614
DAIRY INDUSTRY	16	0.000699	0.000715	0.000487	0.000345	0.000733	0.000631
FEEDS MFR IND	17	0.000225	0.000207	0.000138	0.000188	0.000303	0.000206
FLOUR CER BAKERY IND	18	0.000062	0.000062	0.000046	0.000040	0.000175	0.000069
VEGETABLE OIL MILLS	19	0.000000	0.000000	0.000001	0.000000	0.000000	0.000000
SOFT DRINKS MFR IND	20	0.000394	0.000407	0.000277	0.000175	0.000366	0.000352
BEERS & ALC MFR IND	21	0.000582	0.000558	0.000378	0.000202	0.000550	0.000488
OTH FOOD MFR IND	22	0.001012	0.000593	0.000397	0.001315	0.001297	0.000614
RUBBER PROD IND	23	0.0	0.0	0.0	0.0	0.0	0.0
LEATHER PROD IND	24	0.0	0.0	0.0	0.0	0.0	0.0
TEXTILE PROD IND	25	0.001674	0.001147	0.000758	0.000771	0.001925	0.004982
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.0	0.0	0.0	0.0	0.0	0.0
WOOD PROD IND	28	0.001335	0.001511	0.002485	0.002421	0.002412	0.004102
FURNITURE IND	29	0.0	0.0	0.0	0.0	0.0	0.0
PULP & PAPER IND	30	0.029818	0.019709	0.009278	0.029126	0.077966	0.027942
PRINTING & PUBL IND	31	0.000531	0.000543	0.000368	0.000491	0.000542	0.000481
PRIMARY MET IND	32	0.180692	0.502725	0.342699	0.237089	0.205200	0.677812
METAL FAB IND	33	0.027841	0.056036	0.057851	0.036376	0.039309	0.094936
MACHINERY IND	34	0.000709	0.000840	0.000844	0.000483	0.000702	0.000671
TRANSP EQUIP IND	35	0.001103	0.001161	0.001343	0.000485	0.001138	0.000984
ELECTR APPL IND	36	0.0	0.0	0.0	0.0	0.0	0.0
CEMENT MFR IND	37	6.950541	0.716063	0.013028	0.009323	0.007745	0.014489
CONCRETE PROD IND	38	0.009497	0.354500	0.003393	0.002645	0.002792	0.007487
READY MIX MFR IND	39	0.004132	0.154242	0.001476	0.001151	0.001215	0.003258
OTH NON-METAL IND	40	0.004960	0.185157	0.001772	0.001381	0.001458	0.003911
PETROLEUM & COAL IND	41	0.034128	0.055122	2.959802	0.090534	0.046673	0.029254
FERTILIZER MFR IND	42	0.006027	0.004631	0.004232	6.794837	0.042237	0.008827
CHEMICAL & REL IND	43	0.922203	0.725272	0.988911	1.288640	16.568130	2.630471
MISC MFR IND	44	0.014875	0.008272	0.007379	0.006136	0.008693	0.570695
NON CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.000041	0.000046	0.000136	0.000088	0.000047	0.000021
TRANSP SERV IND	47	0.0	0.0	0.0	0.0	0.0	0.0
STORAGE SERV IND	48	0.000164	0.000224	0.000137	0.000153	0.000204	0.000195
COMMUNIC SERV IND	49	0.0	0.0	0.0	0.0	0.0	0.0
ELECTRICAL POWER	50	0.053473	0.034612	0.031115	0.057733	0.032101	0.024519
GAS DISTRIB IND	51	0.0	0.0	0.0	0.0	0.0	0.0
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.002491	0.004136	0.002019	0.002882	0.003616	0.003659
RETAIL TRADE	54	0.000343	0.000410	0.000270	0.000344	0.000355	0.000322
FINANCE	55	0.000295	0.000288	0.001049	0.000571	0.000403	0.000296
REAL ESTATE RENTAL	56	0.000005	0.000005	0.000003	0.000004	0.000007	0.000004
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000003
HOSPITAL & HEALTH	58	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
ACCOM & FOOD SERV	59	0.001105	0.001138	0.000770	0.001024	0.001114	0.000997
BUSINESS SERV IND	60	0.0	0.0	0.0	0.0	0.0	0.0
PERSONAL SERV IND	61	0.0	0.0	0.0	0.0	0.0	0.0
SUM		8.517159	3.095054	11.829954	11.502029	17.366165	4.290319

TABLE C-7 CONSUMPTIVE WATER USE INTERACTION (CONTINUED) PAGE

		NEW CONSTRUCT 49	REPAIR CONSTRUCT 50	TRANSP SERV 51	STORAGE SERV 52	COMMUNIC 53	ELECT POWER 54
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.053799	0.083627	0.034278	0.070054	0.038686	0.028864
POULTRY & EGG PRDRS	7	0.001670	0.001607	0.000591	0.001558	0.000621	0.000478
DAIRY PRODUCERS	8	0.000026	0.000032	0.000012	0.000032	0.000013	0.000010
OTH AG PRDRS	9	0.0	0.0	0.0	0.0	0.0	0.0
FORESTRY PRDRS	10	0.0	0.0	0.0	0.0	0.0	0.0
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.000012	0.000011	0.000010	0.000010	0.000004	0.000740
CRUDE OIL & GAS IND	13	0.190370	0.337908	0.254769	0.137375	0.048405	0.570863
OTH MINING IND	14	0.0	0.0	0.0	0.0	0.0	0.0
MEAT PROC IND	15	0.001050	0.001477	0.000600	0.001570	0.000628	0.000478
DAIRY INDUSTRY	16	0.000434	0.000630	0.000268	0.000705	0.000279	0.000213
FEEDS MFR IND	17	0.000203	0.000262	0.000082	0.000200	0.000090	0.000069
FLOUR CER BAKERY IND	18	0.000039	0.000062	0.000023	0.000058	0.000023	0.000018
VEGETABLE OIL MILLS	19	0.000000	0.000012	0.000000	0.000001	0.000000	0.000001
SOFT DRINKS MFR IND	20	0.000247	0.000378	0.000152	0.000404	0.000160	0.000122
BEERS & ALC MFR IND	21	0.000338	0.000460	0.000207	0.000548	0.000216	0.000165
OTH FOOD MFR IND	22	0.000380	0.000565	0.000196	0.000511	0.000205	0.000158
RUBBER PROD IND	23	0.0	0.0	0.0	0.0	0.0	0.0
LEATHER PROD IND	24	0.0	0.0	0.0	0.0	0.0	0.0
TEXTILE PROD IND	25	0.003275	0.001669	0.000746	0.003142	0.000744	0.000343
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.0	0.0	0.0	0.0	0.0	0.0
WOOD PROD IND	28	0.017920	0.038323	0.000969	0.002474	0.001484	0.002005
FURNITURE IND	29	0.0	0.0	0.0	0.0	0.0	0.0
PULP & PAPER IND	30	0.010074	0.011255	0.003102	0.009381	0.003414	0.002046
PRINTING & PUBL IND	31	0.000334	0.000426	0.000318	0.000533	0.000434	0.000179
PREPARY MET IND	32	1.763298	3.169403	0.114129	0.260023	0.172923	0.192266
METAL FAB IND	33	0.196035	0.226069	0.013935	0.029347	0.018945	0.016578
MACHINERY IND	34	0.001374	0.005897	0.000330	0.000885	0.000422	0.000540
TRANSP EQUIP IND	35	0.001015	0.001156	0.001997	0.001150	0.000499	0.000399
ELECTR APPL IND	36	0.0	0.0	0.0	0.0	0.0	0.0
CEMENT MFR IND	37	0.080044	0.229648	0.004783	0.013691	0.008385	0.011560
CONCRETE PROD IND	38	0.021842	0.054260	0.001371	0.003532	0.002129	0.002814
READY MIX MFR IND	39	0.009503	0.023609	0.000557	0.001537	0.000926	0.001224
OTH NON-METAL IND	40	0.011408	0.028341	0.000716	0.001845	0.001112	0.001470
PETROLEUM & COAL IND	41	0.068181	0.121421	0.098565	0.048896	0.016727	0.027416
FERTILIZER MFR IND	42	0.003332	0.005048	0.001619	0.003480	0.001655	0.001232
CHEMICAL & REL IND	43	0.483874	0.769006	0.166164	0.257635	0.139075	0.094668
MISC MFR IND	44	0.011701	0.026514	0.002445	0.008334	0.003238	0.002831
NEW CONSTR IND	45	0.013500	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.000028	0.002642	0.000044	0.000144	0.000090	0.000130
TRANSP SERV IND	47	0.0	0.0	0.0	0.0	0.0	0.0
STORAGE SERV IND	48	0.000252	0.000482	0.000123	0.114674	0.000091	0.000078
COMMUNIC SERV IND	49	0.0	0.0	0.0	0.0	0.0	0.0
ELECTRICAL POWER	50	0.018792	0.030122	0.030263	0.028593	0.011253	2.216629
GAS DISTRIB IND	51	0.0	0.0	0.0	0.0	0.0	0.0
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.005410	0.007707	0.002077	0.002437	0.000999	0.001059
RETAIL TRADE	54	0.000758	0.001350	0.000560	0.000509	0.000687	0.000501
FINANCE	55	0.000293	0.000305	0.000138	0.000403	0.000274	0.000351
REAL ESTATE RENTAL	56	0.000004	0.000005	0.000002	0.000005	0.000002	0.000002
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
ACCOM & FOOD SERV	59	0.000690	0.000874	0.000423	0.001121	0.000441	0.000334
BUSINESS SERV IND	60	0.0	0.0	0.0	0.0	0.0	0.0
PERSONAL SERV IND	61	0.0	0.0	0.0	0.0	0.0	0.0
SUM		2.971495	5.182556	0.736603	1.006791	0.475278	3.178848

TABLE C-7 CONSUMPTIVE WATER USE INTERACTION (CONTINUED)

		GAS PIPE SERV 55	WATER & OTH 56	WHOLESALE 57	RETAIL 58	FINANCE & OTH 59	REAL ESTATE 60
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.018576	0.105971	0.052778	1.343596	0.026356	0.033530
POULTRY & EGG PRDRS	7	0.000479	0.001889	0.001324	0.001522	0.000665	0.001505
DAIRY PRODUCERS	8	0.000010	0.000039	0.000026	0.000065	0.000013	0.000020
OTH AG PRDRS	9	0.0	0.0	0.0	0.0	0.0	0.0
FORESTRY PRDRS	10	0.0	0.0	0.0	0.0	0.0	0.0
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.000004	0.000015	0.000006	0.000016	0.000003	0.000004
CRUDE OIL & GAS IND	13	0.029346	1.102025	0.120700	0.128446	0.044340	0.048476
OTH MINING IND	14	0.0	0.0	0.0	0.0	0.0	0.0
MEAT PROC IND	15	0.000477	0.001903	0.001358	0.002053	0.000659	0.000846
DAIRY INDUSTRY	16	0.000216	0.000848	0.000594	0.000604	0.000297	0.000350
FEEDS MFR IND	17	0.000058	0.000265	0.000164	0.001329	0.000083	0.000178
FLOUR CER BAKERY IND	18	0.000018	0.000071	0.000058	0.000049	0.000025	0.000042
VEGETABLE OIL MILLS	19	0.000000	0.000001	0.000000	0.000000	0.000001	0.000023
SOFT DRINKS MFR IND	20	0.000124	0.000486	0.000339	0.000340	0.000171	0.000518
BEERS & ALC MFR IND	21	0.000168	0.000658	0.000463	0.000462	0.000229	0.000242
OTH FOOD MFR IND	22	0.000156	0.000624	0.000444	0.000455	0.000219	0.000235
RUBBER PROD IND	23	0.0	0.0	0.0	0.0	0.0	0.0
LEATHER PROD IND	24	0.0	0.0	0.0	0.0	0.0	0.0
TEXTILE PROD IND	25	0.000291	0.001659	0.001757	0.003905	0.000450	0.001171
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.0	0.0	0.0	0.0	0.0	0.0
WOOD PROD IND	28	0.001294	0.004982	0.001938	0.001397	0.002921	0.005022
FURNITURE IND	29	0.0	0.0	0.0	0.0	0.0	0.0
PULP & PAPER IND	30	0.001734	0.008154	0.008359	0.011817	0.002701	0.001995
PRINTING & PUBL IND	31	0.000161	0.000636	0.000505	0.000485	0.000254	0.000068
PRIMARY MET IND	32	0.122668	0.465433	0.138403	0.146798	0.260669	0.287337
METAL FAB IND	33	0.011742	0.049473	0.024611	0.023659	0.022433	0.026732
MACHINERY IND	34	0.000348	0.001327	0.000556	0.000652	0.000638	0.000890
TRANSP EQUIP IND	35	0.000328	0.001377	0.000915	0.000918	0.000458	0.000216
ELECTR APPL IND	36	0.0	0.0	0.0	0.0	0.0	0.0
CEMENT MFR IND	37	0.007442	0.026631	0.003501	0.005273	0.017028	0.019924
CONCRETE PROD IND	38	0.001828	0.006609	0.001149	0.001577	0.004114	0.004347
READY MIX MFR IND	39	0.000796	0.002876	0.000500	0.000686	0.001750	0.001891
OTH NON-METAL IND	40	0.000955	0.003452	0.000600	0.000823	0.002149	0.002270
PETROLEUM & COAL IND	41	0.009957	0.436700	0.043030	0.033681	0.013743	0.016720
FERTILIZER MFR IND	42	0.001005	0.004918	0.003457	0.024608	0.001455	0.001651
CHEMICAL & REL IND	43	0.073080	0.446811	0.215735	0.256780	0.120744	0.151316
MISC MFR IND	44	0.001997	0.008479	0.005626	0.005047	0.003444	0.006003
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.000083	0.000292	0.000028	0.000046	0.000197	0.000203
TRANSP SERV IND	47	0.0	0.0	0.0	0.0	0.0	0.0
STORAGE SERV IND	48	0.000051	0.000328	0.002437	0.001275	0.000083	0.001284
COMMUNIC SERV IND	49	0.0	0.0	0.0	0.0	0.0	0.0
ELECTRICAL POWER	50	0.010396	0.039864	0.016733	0.047648	0.008379	0.011061
GAS DISTRIB IND	51	0.0	0.0	0.0	0.0	0.0	0.0
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.000602	0.004784	0.076755	0.001264	0.001092	0.001212
RETAIL TRADE	54	0.000134	0.001677	0.000375	0.043878	0.000210	0.000258
FINANCE	55	0.000217	0.000385	0.000478	0.000686	0.007459	0.000479
REAL ESTATE RENTAL	56	0.000001	0.000007	0.000005	0.000055	0.000002	0.020833
EDUCATION & RELATED	57	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000000	0.000001	0.000000	0.000000	0.000000	0.000000
ACCOM & FOOD SERV	59	0.000342	0.001342	0.000948	0.000948	0.000465	0.000808
BUSINESS SERV IND	60	0.0	0.0	0.0	0.0	0.0	0.0
PERSONAL SERV IND	61	0.0	0.0	0.0	0.0	0.0	0.0
SUM		0.297083	2.732574	0.726656	2.094829	0.545534	0.649680

TABLE C-7 CONSUMPTIVE WATER USE INTERACTION (CONTINUED)

PAGE

		EDUCATION 61	HEALTH SERV 62	ACCOM & FOOD 63	BUSINESS SERV 64	PERSONAL SERV 65
WHEAT PRODUCERS	1	0.0	0.0	0.0	0.0	0.0
BARLEY PRODUCERS	2	0.0	0.0	0.0	0.0	0.0
OIL SEEDS PRDRS	3	0.0	0.0	0.0	0.0	0.0
OTH GRAIN PRDRS	4	0.0	0.0	0.0	0.0	0.0
FORAGE PRDRS	5	0.0	0.0	0.0	0.0	0.0
LIVESTOCK PRDRS	6	0.104880	0.033748	1.826251	0.037216	0.054267
POULTRY & EGG PRDRS	7	0.002847	0.000854	0.109539	0.000988	0.001365
DAIRY PRODUCERS	8	0.000057	0.000017	0.000667	0.000020	0.000027
OTH AG PRDRS	9	0.0	0.0	0.0	0.0	0.0
FORESTRY PRDRS	10	0.0	0.0	0.0	0.0	0.0
FISHING, H & T PRDRS	11	0.0	0.0	0.0	0.0	0.0
COAL MINING IND	12	0.000007	0.000003	0.000008	0.000002	0.000010
CRUDE OIL & GAS IND	13	0.190223	0.054325	0.127514	0.031504	0.107754
OTH MINING IND	14	0.0	0.0	0.0	0.0	0.0
MEAT PROC IND	15	0.002869	0.000858	0.059993	0.000995	0.001416
DAIRY INDUSTRY	16	0.001302	0.000385	0.014640	0.000451	0.000607
FEEDS MFR IND	17	0.000332	0.000105	0.008817	0.000117	0.000233
FLOUR GER BAKERY IND	18	0.000105	0.000034	0.001536	0.000037	0.000054
VEGETABLE OIL MILLS	19	0.000000	0.000000	0.000000	0.000000	0.000000
SOFT DRINKS MFR IND	20	0.000745	0.000219	0.006062	0.000258	0.000345
BEERS & ALC MFR IND	21	0.001017	0.000300	0.000335	0.000352	0.000472
OTH FOOD MFR IND	22	0.000923	0.000296	0.011572	0.000321	0.000471
RUBBER PROD IND	23	0.0	0.0	0.0	0.0	0.0
LEATHER PROD IND	24	0.0	0.0	0.0	0.0	0.0
TEXTILE PROD IND	25	0.001555	0.003736	0.005852	0.000633	0.005958
KNITTING MILL IND	26	0.0	0.0	0.0	0.0	0.0
CLOTHING IND	27	0.0	0.0	0.0	0.0	0.0
WOOD PROD IND	28	0.000778	0.000602	0.001052	0.000457	0.004294
FURNITURE IND	29	0.0	0.0	0.0	0.0	0.0
PULP & PAPER IND	30	0.011969	0.005003	0.009666	0.003806	0.008815
PRINTING & PUBL IND	31	0.001763	0.000299	0.000267	0.000371	0.000471
PRIMARY MET IND	32	0.184237	0.084396	0.114975	0.069540	0.151195
METAL FAB IND	33	0.032987	0.013167	0.017561	0.011864	0.027597
MACHINERY IND	34	0.001124	0.000363	0.000523	0.000402	0.000586
TRANSP EQUIP IND	35	0.001973	0.000583	0.000568	0.000675	0.000924
ELECTR APPL IND	36	0.0	0.0	0.0	0.0	0.0
CEMENT MFR IND	37	0.003440	0.002637	0.006085	0.001719	0.004550
CONCRETE PROD IND	38	0.001328	0.000884	0.002100	0.000574	0.001441
READY MIX MFR IND	39	0.000578	0.000384	0.000914	0.000250	0.000627
OTH NON-METAL IND	40	0.000694	0.000461	0.001097	0.000300	0.000753
PETROLEUM & COAL IND	41	0.034990	0.018281	0.033636	0.010798	0.036446
FERTILIZER MFR IND	42	0.005633	0.002714	0.050544	0.001985	0.004503
CHEMICAL & REL IND	43	0.337889	0.513927	0.278174	0.122014	0.816427
MISC MFR IND	44	0.013025	0.014779	0.004685	0.003096	0.008725
NEW CONSTR IND	45	0.0	0.0	0.0	0.0	0.0
REPAIR CONSTR IND	46	0.000017	0.000019	0.000041	0.000012	0.000030
TRANSP SERV IND	47	0.0	0.0	0.0	0.0	0.0
STORAGE SERV IND	48	0.000213	0.000117	0.002504	0.000339	0.000151
COMMUNIC SERV IND	49	0.0	0.0	0.0	0.0	0.0
ELECTRICAL POWER	50	0.020072	0.008169	0.022911	0.005915	0.028347
GAS DISTRIB IND	51	0.0	0.0	0.0	0.0	0.0
WATER & OTH IND	52	0.0	0.0	0.0	0.0	0.0
WHOLESALE TRADE	53	0.001883	0.002022	0.002671	0.000957	0.002230
RETAIL TRADE	54	0.000561	0.000253	0.000495	0.000224	0.000369
FINANCE	55	0.000226	0.000140	0.000378	0.000301	0.000661
REAL ESTATE RENTAL	56	0.000008	0.000002	0.000114	0.000003	0.000004
EDUCATION & RELATED	57	0.040310	0.000002	0.000000	0.000000	0.000000
HOSPITAL & HEALTH	58	0.000000	0.038100	0.000000	0.000003	0.000004
ACCOM & FOOD SERV	59	0.002085	0.000614	0.111059	0.000732	0.000966
BUSINESS SERV IND	60	0.0	0.0	0.0	0.0	0.0
PERSONAL SERV IND	61	0.0	0.0	0.0	0.0	0.0
SUM		1.004644	0.803099	2.834790	0.309219	1.273094

APPENDIX D

SECTORAL FINAL DEMAND SCENARIOS AND PROJECTED OUTPUT AND WATER DEMANDS FOR 1980 AND 1985

TABLE D-1

OUTPUT PROJECTIONS BY INDUSTRY, 1980 & 1985

(million 1972 dollars)

Industry	1980 Low	1980 Med	1980 High	1985 Low	1985 Med	1985 High
Wheat	83.2	87.2	91.3	96.0	103.4	111.4
Barley	122.0	130.1	138.4	139.1	154.1	170.3
Oilseed	30.7	32.1	33.6	35.3	38.0	40.9
Oth grains	78.5	85.4	92.5	88.7	101.4	115.0
Forage	53.7	62.6	71.9	57.8	74.1	91.6
Livestock	149.9	176.3	203.5	160.9	209.2	260.9
Poultry, egg	19.6	21.2	23.0	21.3	24.3	27.6
Dairy, unp	26.1	28.5	31.1	28.8	33.2	38.2
Oth agr	11.8	12.8	13.9	12.7	14.5	16.5
Forest	7.6	10.8	14.2	10.6	16.7	23.3
Fishing	2.9	3.1	3.4	3.1	3.5	4.0
Coal	14.9	17.8	19.3	18.5	24.1	28.2
Oil & gas	856.5	906.6	958.7	927.1	1018.4	1107.4
Oth mining	65.5	76.2	87.1	78.6	98.9	120.2
Meat proc	306.7	331.8	358.7	338.9	384.9	436.9
Dairy proc	53.0	57.4	62.1	58.6	66.7	75.7
Feeds mfr	16.4	18.3	20.2	17.8	21.2	24.9
Flour, cer	19.5	21.2	22.9	21.6	24.7	28.1
Veg Oil	11.2	12.1	13.1	12.4	14.0	15.9
Soft drinks	12.0	13.0	14.1	13.3	15.1	17.2
Breweries	29.0	31.5	34.1	32.2	36.6	41.6
Oth foods	3.7	5.1	6.6	4.4	7.0	9.8
Rubber mfr	17.1	19.4	21.7	20.1	24.4	29.0
Leather mfr	2.7	2.9	3.2	3.0	3.5	4.0

TABLE D-1 (continued)

Industry	1980			1985		
	Low	Med	High	Low	Med	High
Textile	16.5	21.1	25.9	19.9	28.4	37.6
Hosiery	2.3	2.5	2.7	2.6	2.9	3.3
Clothing	25.1	27.1	29.3	27.7	31.5	35.8
Wood prod	56.5	66.7	77.2	71.4	91.0	112.1
Furnitures	18.1	19.6	21.2	20.2	23.0	26.1
Pulp & paper	24.2	36.5	49.3	33.2	56.4	81.7
Print & pub	41.3	47.0	53.0	46.6	57.3	68.8
Primary met	91.3	118.5	146.5	124.8	176.8	232.4
Metal fabr	109.5	133.3	157.8	141.7	187.2	236.2
Machinery	36.9	48.7	60.7	46.5	68.3	91.3
Transp Equip	34.9	38.3	41.8	39.4	45.7	52.6
Appliances	12.3	20.9	29.8	21.2	37.5	54.9
Cement	20.6	22.4	24.2	24.3	27.8	31.6
Concrete	33.7	36.8	40.0	40.1	46.1	52.7
Ready mix	29.6	32.3	35.2	35.2	40.5	46.4
Oth non-met	22.9	25.0	27.2	27.3	31.4	35.9
Petroleum	246.6	267.2	289.2	285.1	324.9	368.8
Fertilizers	90.4	97.6	105.2	98.1	111.0	125.3
Chemical	123.7	144.5	167.3	153.5	195.9	245.9
Misc mfr	10.6	19.3	28.0	11.6	27.9	44.4
New Constr	1045.3	1128.5	1217.3	1271.6	1439.7	1628.4
Repair cons	134.4	146.5	158.4	149.1	171.4	194.7
Transp serv	266.0	291.3	317.7	300.3	347.3	399.5
Storage	30.7	33.3	36.1	33.9	38.7	44.1
Communic	126.1	137.5	149.4	140.6	161.4	184.6
Power gen	166.1	200.4	217.0	208.4	274.9	323.3
Gas distr	50.9	56.5	61.6	58.7	69.3	80.0

TABLE D-1 (continued)

Industry	1980 Low	1980 Med	1980 High	1985 Low	1985 Med	1985 High
Water & util	14.6	15.8	17.1	16.8	19.1	21.7
Wholesale	167.4	184.7	202.7	194.0	226.7	262.7
Retail	465.9	504.3	545.2	516.7	587.2	666.6
Finance	501.8	542.8	585.3	555.5	630.9	711.9
Real est	421.1	455.6	492.5	444.8	505.2	573.2
Education	268.5	290.6	314.2	282.2	320.7	364.1
Hospital	113.7	123.0	133.0	119.5	135.8	154.1
Accom & food	149.1	161.7	175.2	165.1	188.3	214.4
Business ser	157.6	171.3	185.7	177.6	203.3	231.1
Personal serv	221.4	240.7	261.1	247.4	283.2	323.1

TABLE D-2

FINAL DEMAND SCENARIOS, 1980 & 1985

(million 1972 dollars)

Commodities	1980 Low	1980 Med	1980 High	1985 Low	1985 Med	1985 High
Wheat	68.3	71.0	73.7	79.1	84.2	89.7
Barley	84.9	88.3	91.8	98.4	104.8	111.6
Oilseeds	24.2	25.1	26.1	28.0	29.8	31.8
Other Grain	47.6	49.5	51.5	55.2	58.8	62.6
Hay,forage	1.8	1.9	2.1	1.9	2.1	2.4
Livestock	-91.1	-84.2	-77.9	-105.5	-93.0	-81.8
Poultry	0.5	0.5	0.6	0.5	0.6	0.7
Eggs	5.9	6.4	6.9	6.2	7.1	8.0
Dairy, unp.	0.1	0.1	0.2	0.1	0.2	0.2
Other agr.	6.7	7.3	7.8	7.0	8.0	9.1
Forest	-2.6	-2.5	-2.4	-2.8	-2.7	-2.5
Fish & oth	1.9	2.0	2.2	2.0	2.2	2.5
Coal	0.9	1.0	1.0	1.0	1.1	1.3
Crude oil	504.6	524.9	546.0	530.3	565.4	602.5
Nat gas	173.4	187.3	202.3	191.4	217.2	236.7
Sulphur	2.9	3.2	3.4	3.2	3.7	4.2
Other min	-8.5	-7.9	-7.3	-9.9	-8.7	-7.7
Beef & meat	273.6	295.8	319.6	302.2	342.8	388.8
Dairy, proc.	40.4	43.7	47.2	44.7	50.7	57.5
Feeds mfr	0.03	0.04	0.04	0.04	0.05	0.05
Veg Oil	10.9	11.7	12.7	12.0	13.6	15.5
Flour, cer.	12.8	13.9	15.0	14.2	16.1	18.2
Soft drinks	10.8	11.7	12.7	12.0	13.6	15.4
Beers, alcoh	27.2	29.4	31.8	30.0	34.1	38.6
Oth foods	-8.0	-7.6	-7.3	-8.6	-8.0	-7.5

TABLE D-2 (continued)

Commodities	1980 Low	1980 Med	1980 High	1985 Low	1985 Med	1985 High
Tires, tubes	0.3	0.4	0.4	0.4	0.4	0.4
Oth Rubbers	-1.7	-1.6	-1.6	-1.8	-1.7	-1.6
Leather	0.9	0.9	1.0	1.0	1.1	1.2
Textile	-16.6	-15.9	-15.3	-17.8	-16.7	-15.7
Hosiery	2.3	2.5	2.7	2.6	2.9	3.3
Clothes	17.2	18.5	20.0	18.9	21.5	24.4
Lumber	-32.6	-31.3	-30.1	-35.1	-32.9	-30.9
Wood prod	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2
Furniture	15.9	17.2	18.6	17.5	19.9	22.6
Pulp & paper	-51.2	-49.3	-47.4	-55.2	-51.8	-48.5
Print & pub	-11.5	-11.1	-10.7	-12.4	-11.7	-10.9
Iron & steel	-82.3	-79.1	-76.0	-88.6	-83.1	-77.9
Oth primary	4.9	5.2	5.7	5.4	6.1	6.9
Metal fabr	-72.6	-69.8	-67.1	-78.2	-73.3	-68.7
Machinery	-56.5	-54.3	-52.2	-60.8	-57.1	-53.5
Vehicles	10.5	11.3	12.2	11.6	13.1	14.9
Appliances	-44.7	-43.0	-41.3	-48.2	-45.2	-42.4
Cement	4.1	4.4	4.8	4.8	5.4	6.1
Oth non-metal	2.1	2.2	2.4	2.3	2.6	2.9
Petroleum,	172.0	185.8	200.6	199.3	226.0	255.9
Fertilizers	52.5	56.7	61.2	55.1	62.5	70.8
Chemical prod	9.5	15.3	22.3	20.1	33.6	51.4
Misc mfr	-40.8	-37.7	-34.8	-47.2	-41.6	-36.6
New constr	1045.3	1128.5	1217.3	1271.6	1439.7	1628.4
Repair cont	10.0	10.9	11.7	11.1	12.6	14.3
Transp serv	139.2	150.6	162.6	153.8	174.5	197.9

TABLE D-2 (continued)

Commodities	1980 Low	1980 Med	1980 High	1985 Low	1985 Med	1985 High
Storage	12.1	13.1	14.2	13.4	15.2	17.2
Communic	58.7	63.4	68.5	64.8	73.5	83.4
Electric pow	117.9	147.2	158.8	154.1	211.4	249.9
Gas pipe	6.8	7.4	8.0	7.5	8.5	9.7
Water & util	12.8	13.8	14.9	14.8	16.8	19.0
Wholesale	28.4	30.7	33.2	31.4	35.6	40.3
Retail	424.8	459.4	496.2	469.2	532.3	603.8
Finance	151.3	163.6	176.7	167.1	189.5	215.0
Real est	391.9	424.0	458.4	411.8	467.9	531.3
Education	268.5	290.5	314.1	282.1	320.6	363.9
Health	113.7	123.0	133.0	119.5	135.7	154.1
Accom & food	122.3	132.2	142.8	135.0	153.2	173.8
Bus serv	17.3	18.7	20.2	19.1	21.6	24.5
Personal ser	137.8	149.0	161.0	152.2	172.7	195.8

TABLE D-3

WATER WITHDRAWAL DEMANDS

PROJECTION BY INDUSTRY

1980 and 1985

(million imperial gallons)

Industry	1980			1985		
	Low	Med	High	Low	Med	High
Wheat	0	0	0	0	0	0
Barley	0	0	0	0	0	0
Oilseed	0	0	0	0	0	0
Oth grain	0	0	0	0	0	0
Forage	0	0	0	0	0	0
Livestock	3577	4207	4858	3839	4994	6226
Poultry	99	107	116	108	123	140
Dairy unp	1	1	1	1	2	2
Oth agr	1	1	1	1	1	2
Forest	0	0.4	0.6	0.4	0.7	1
Fishing	0	0	0	0	0	0
Coal	3	3	4	3	5	5
Oil & gas	11496	12168	12867	12444	13668	14864
Oth mining	2098	2439	2791	2518	3167	3849
Meat proc	1135	1228	1327	1254	1424	1617
Dairy proc	109	118	128	121	137	156
Feeds mfr	170	189	209	184	219	257
Flour & oth	12	13	14	13	15	17
Veg Oil	2	3	3	3	3	3
Soft drinks	118	128	138	131	148	168
Breweries	135	146	158	149	170	193

TABLE D-3 (continued)

Industry	1980			1985		
	Low	Med	High	Low	Med	High
Oth foods	7	9	12	8	13	18
Rubber mfr	3	3	3	3	4	4
Leather mfr	54	59	64	60	70	80
Textile	5	7	9	7	9	12
Hosiery	0	0	0	0	0	0
Clothing	5	5	5	5	6	7
Wood prod	22	26	30	28	36	44
Furnitures	4	4	4	4	5	5
Pulp & paper	22	33	45	30	51	74
Print & pub	4	4	5	4	5	6
Prim metal	1627	2112	2611	2224	3150	4142
Metal fabr	511	622	736	661	873	1102
Machinery	6	8	10	7	11	15
Transp equip	22	24	26	25	28	33
Appliances	12	21	30	21	37	55
Cement	152	165	178	179	204	232
Concrete	45	49	53	53	61	70
Ready mix	54	59	64	64	74	84
Oth non-met	45	49	53	53	61	70
Petroleum	2759	2991	3235	3191	3635	4127
Fertilizers	1049	1132	1220	1138	1288	1454
Chemical	5588	6534	7567	6943	8862	11121
Misc mfr	60	110	159	66	159	253
New constr	75	81	87	91	103	116
Repair cons	2	3	3	3	3	3
Transp serv	26	29	31	29	34	39
Storage	101	110	119	112	128	146
Communic	30	32	35	33	38	43

TABLE D-3 (continued)

Industry	1980 Low	1980 Med	1980 High	1985 Low	1985 Med	1985 High
Power gen	366	441	478	459	605	711
Gas distr	8	9	10	10	11	13
Water util	0	0	0	0	0	0
Wholesale	195	214	235	225	263	305
Retail	339	367	397	376	427	485
Finance	55	60	65	61	70	79
Real est	27	29	32	29	33	37
Education	35	37	41	36	41	47
Hospital	58	63	68	61	70	79
Accom & food	207	225	243	229	262	298
Business ser	35	38	41	39	45	51
Personal ser	62	67	73	69	79	90